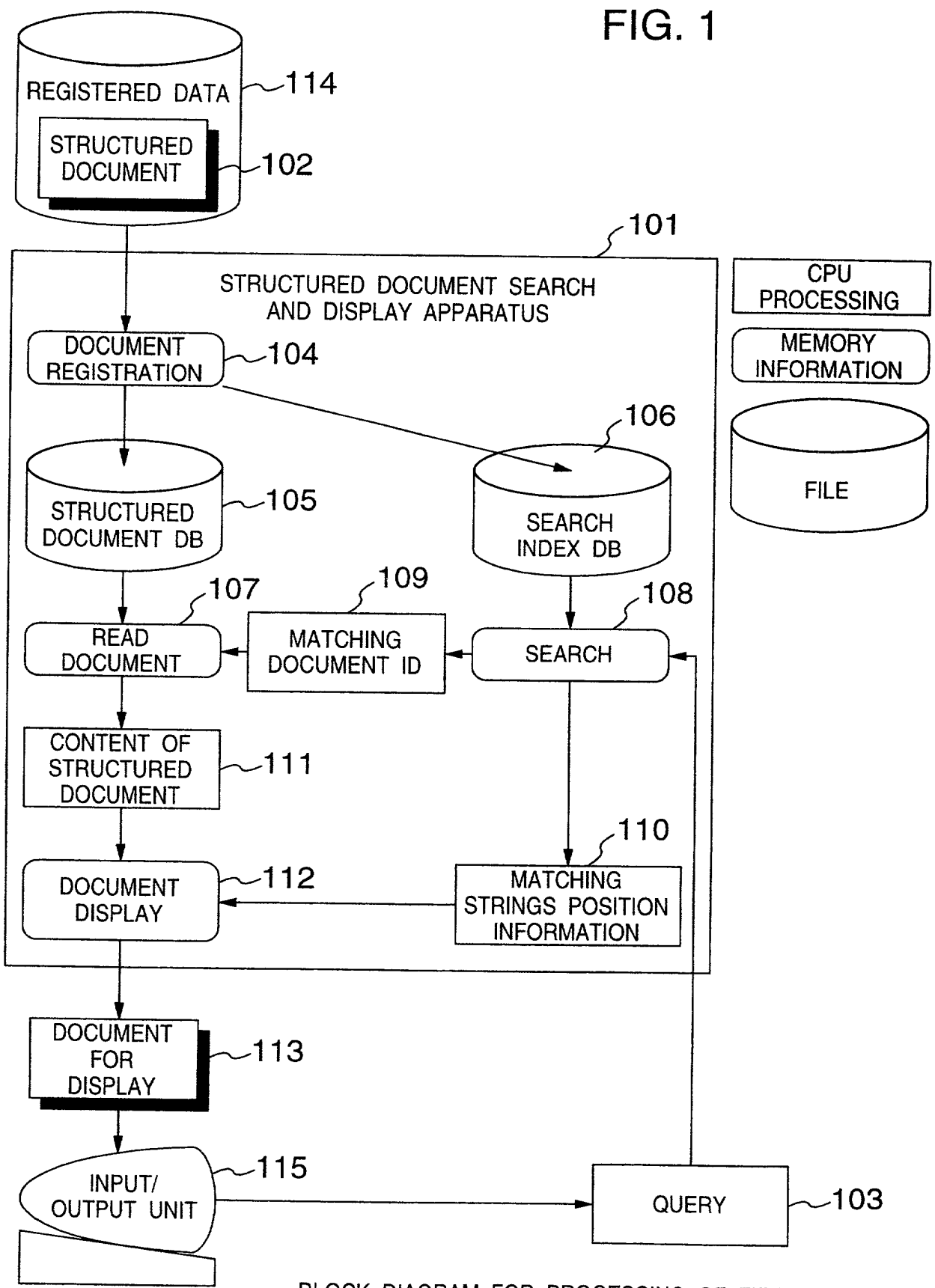


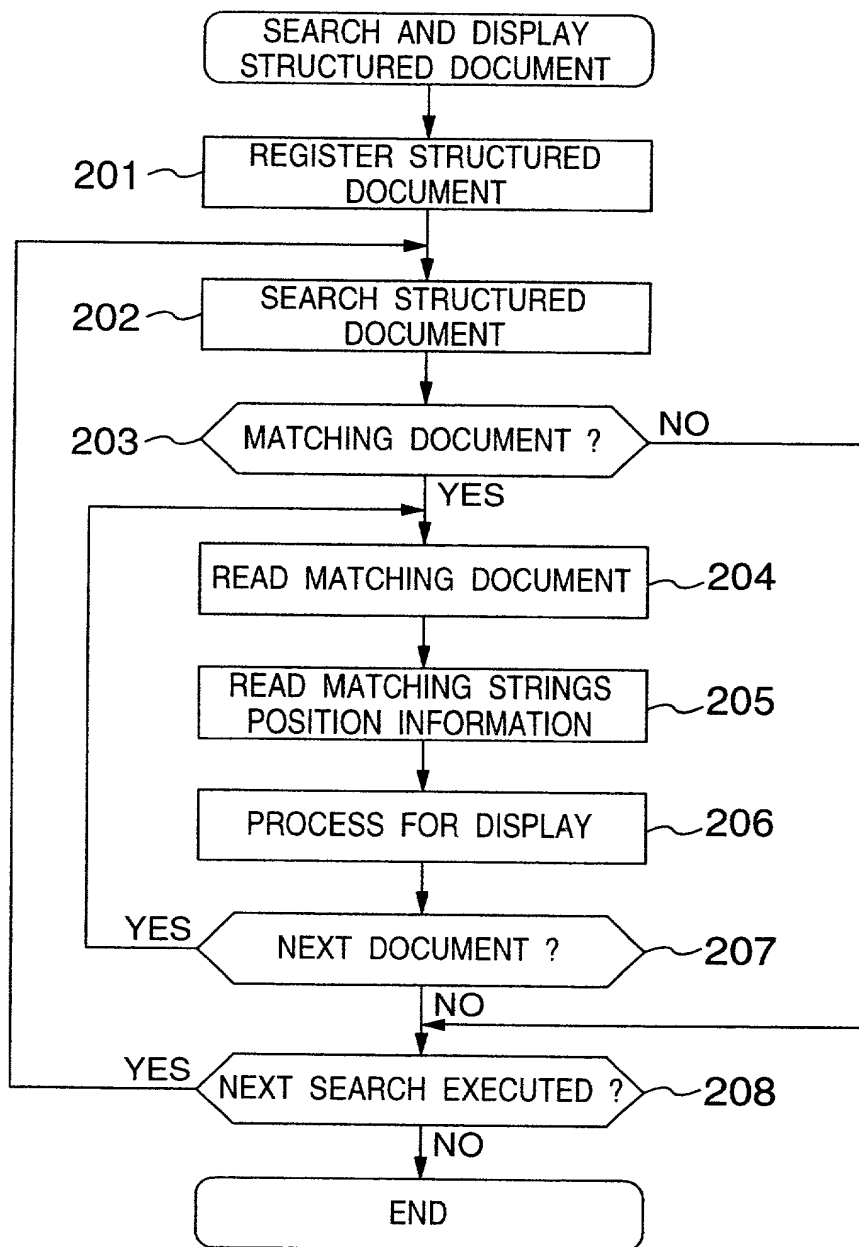
2000-04-24 14:55:00

FIG. 1



<BLOCK DIAGRAM FOR PROCESSING OF FIRST AND SECOND EMBODIMENTS>

FIG. 2

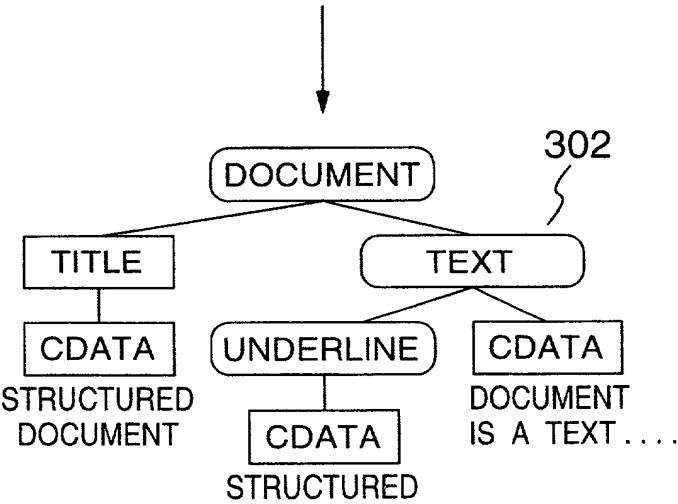


<FLOWCHART FOR DOCUMENT DISPLAY PROCESS
OF FIRST EMBODIMENT>

FIG. 3

<REGISTRATION OF STRUCTURED DOCUMENT> 301

```
<!DOCTYPE DOCUMENT SYSTEM "DOCUMENT.dtd">
<DOCUMENT>
<TITLE> STRUCTURED DOCUMENT </TITLE>
<TEXT>
<UNDERLINE> STRUCTURED </UNDERLINE> DOCUMENT IS A TEXT ....
</TEXT>
</DOCUMENT>
```



DATA CONVERSION INTO
TABLE FORMAT

ELEMENT ID	ELEMENT TYPE	TAG	CONTENT
0	DOCUMENT	DOCUMENT	SUBELEMENT: 1, 3
1	ELEMENT	TITLE	SUBELEMENT: 2
2	CDATA	—	CHARACTER STRING: "STRUCTURED DOCUMENT"
3	ELEMENT	TEXT	SUBELEMENT: 4, 6
4	ELEMENT	UNDERLINE	SUBELEMENT: 5
5	CDATA	—	CHARACTER STRING: "STRUCTURED"
6	CDATA	—	CHARACTER STRING: "DOCUMENT IS

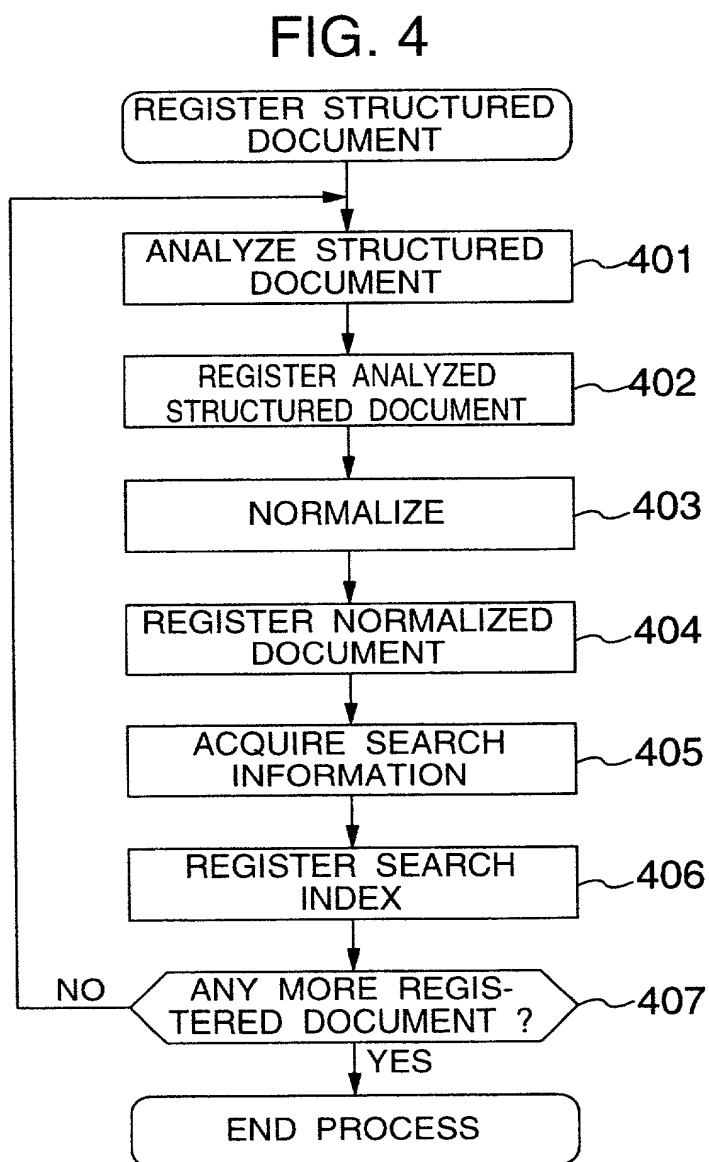


FIG. 5

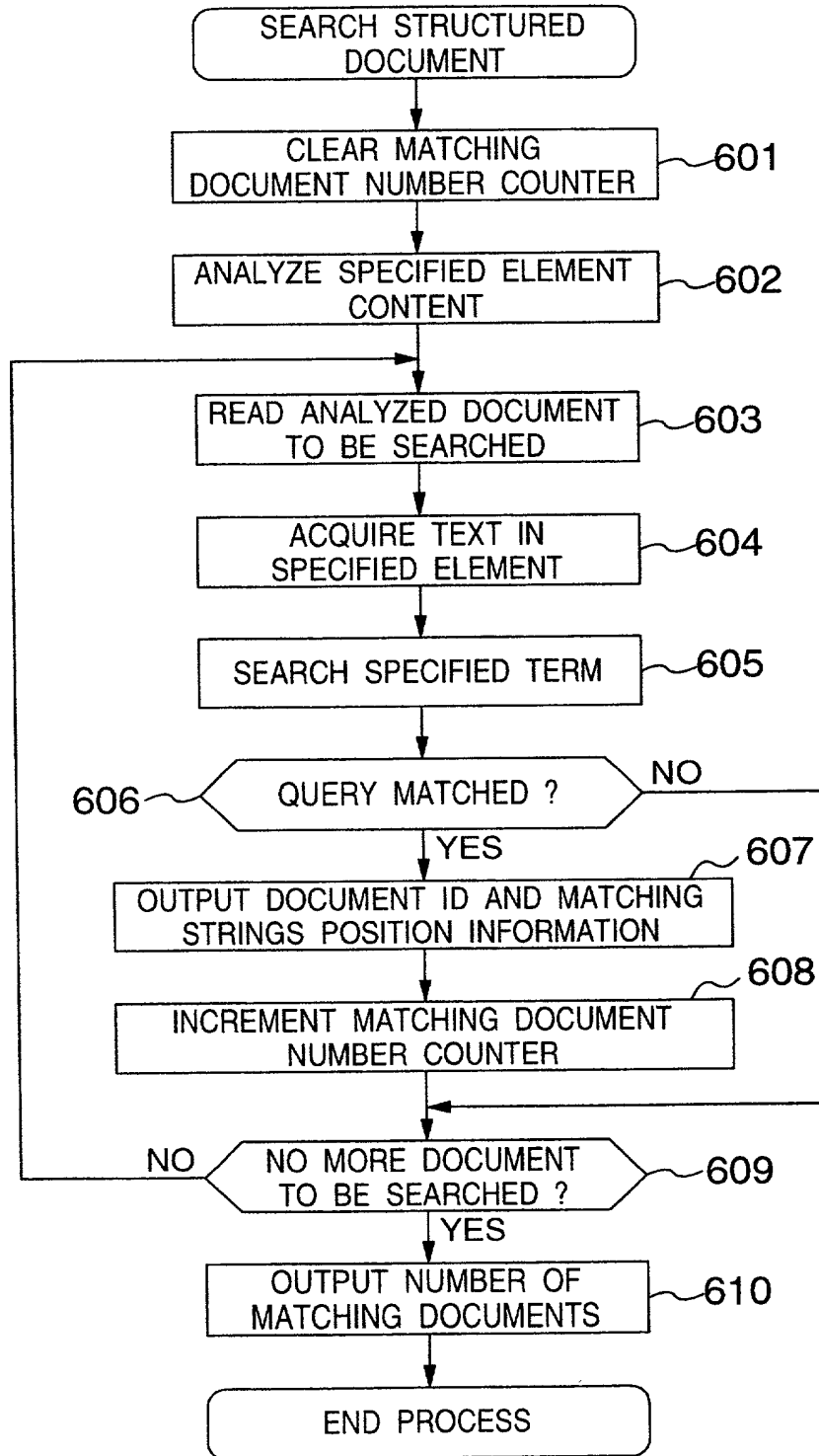
<TEXT FOR SEARCH>

ELEMENT ID	START CHARACTER POSITION	CHARACTER STRING LENGTH
2	0	10
5	10	6
6	16	44
:	:	:

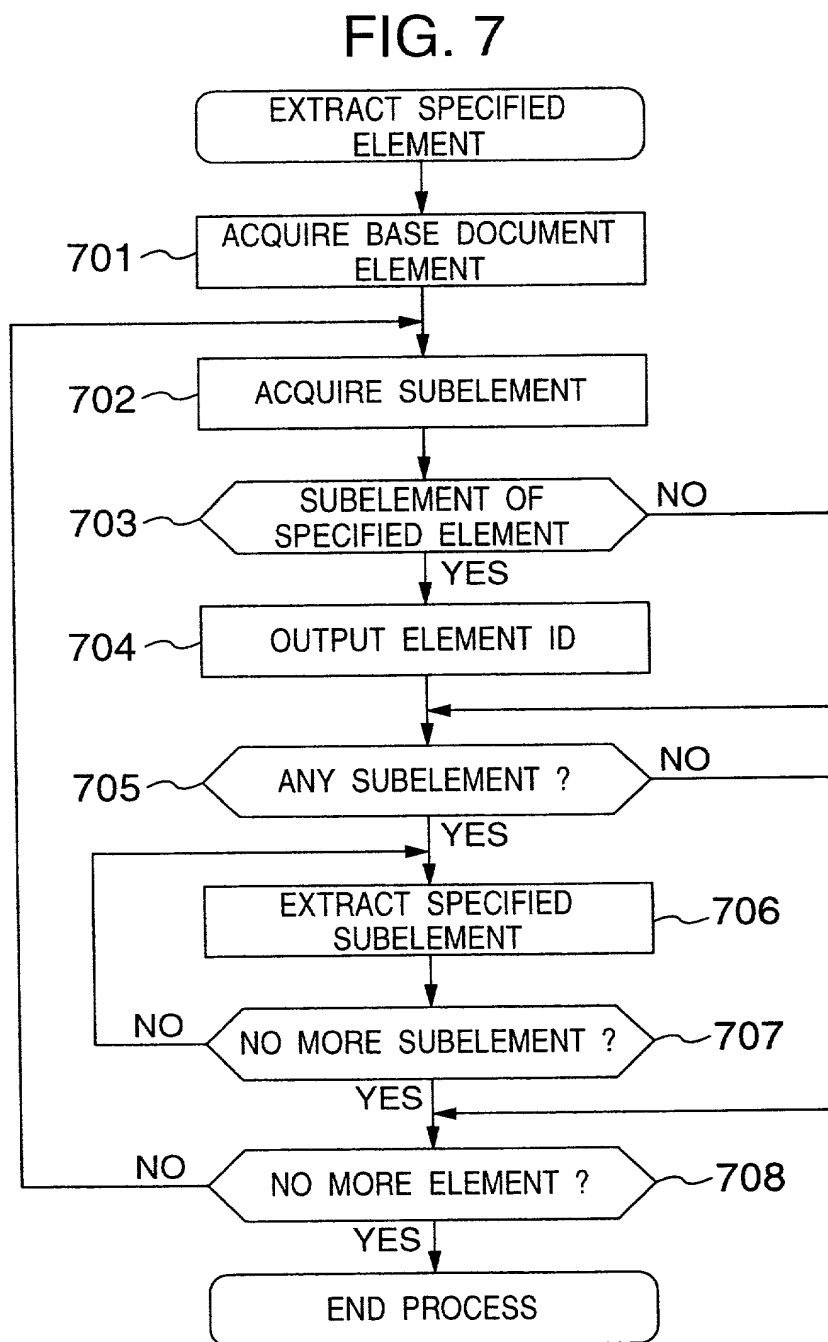
<CHARACTER STRING>

STRUCTURED DOCUMENT IS

FIG. 6



<FLOWCHART FOR SEARCH OF STRUCTURED DOCUMENT>



<FLOWCHART FOR EXTRACTION OF SPECIFIED ELEMENT>

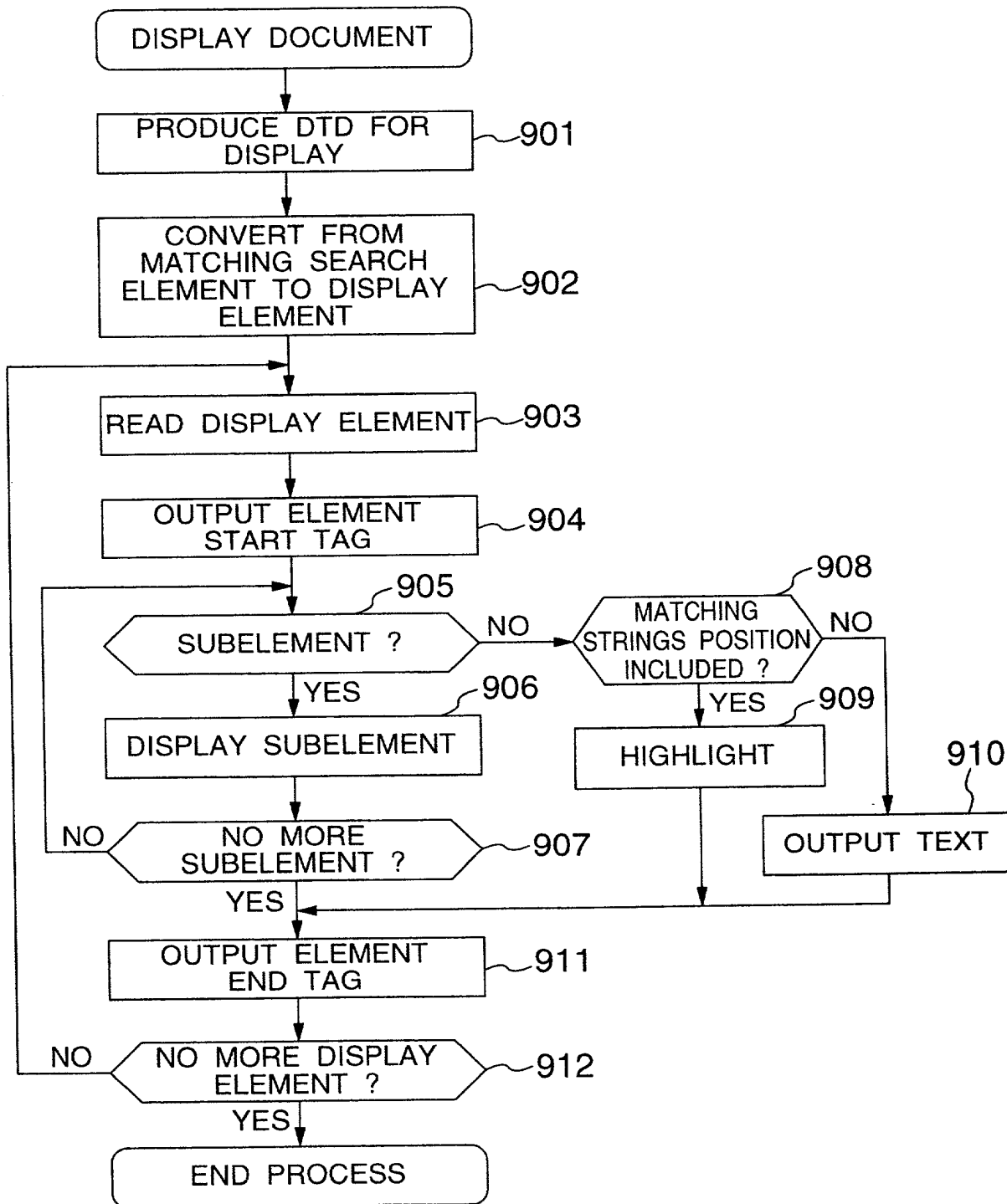
FIG. 8

<RESULT OF ANALYSIS OF SPECIFIED ELEMENT>

NUMBER OF ELEMENTS	N	801
-----------------------	---	-----

N	ELEMENT ID	802
	2	
	3	
	4	
	7	
	8	
	⋮	

FIG. 9



<FLOWCHART FOR DISPLAY OF STRUCTURED DOCUMENT>

FIG. 10

<EXAMPLE OF STRUCTURED DOCUMENT>

[DTD] (DOCUMENT. dtd)

1001

```
<!ELEMENT DOCUMENT... (TITLE, TEXT)>
<!ELEMENT TITLE      ... CDATA>
<!ELEMENT TEXT       ... (#PCDATA | UNDERLINE)*>
<!ELEMENT UNDERLINE ... CDATA>
```

[DOCUMENT INSTANCE]

1002

```
<!DOCTYPE DOCUMENT SYSTEM "DOCUMENT. dtd">
<DOCUMENT>
<TITLE> STRUCTURED DOCUMENT </TITLE>
<TEXT>
<UNDERLINE> STRUCTURED </UNDERLINE> DOCUMENT IS
A TEXT ....
</TEXT>
</DOCUMENT>
```

SEARCH AND DISPLAY
"STRUCTURED DOCUMENT"

<EXAMPLE OF HIGHLIGHTED STRUCTURED DOCUMENT>

[DTD] (DISPLAY. dtd)

1003

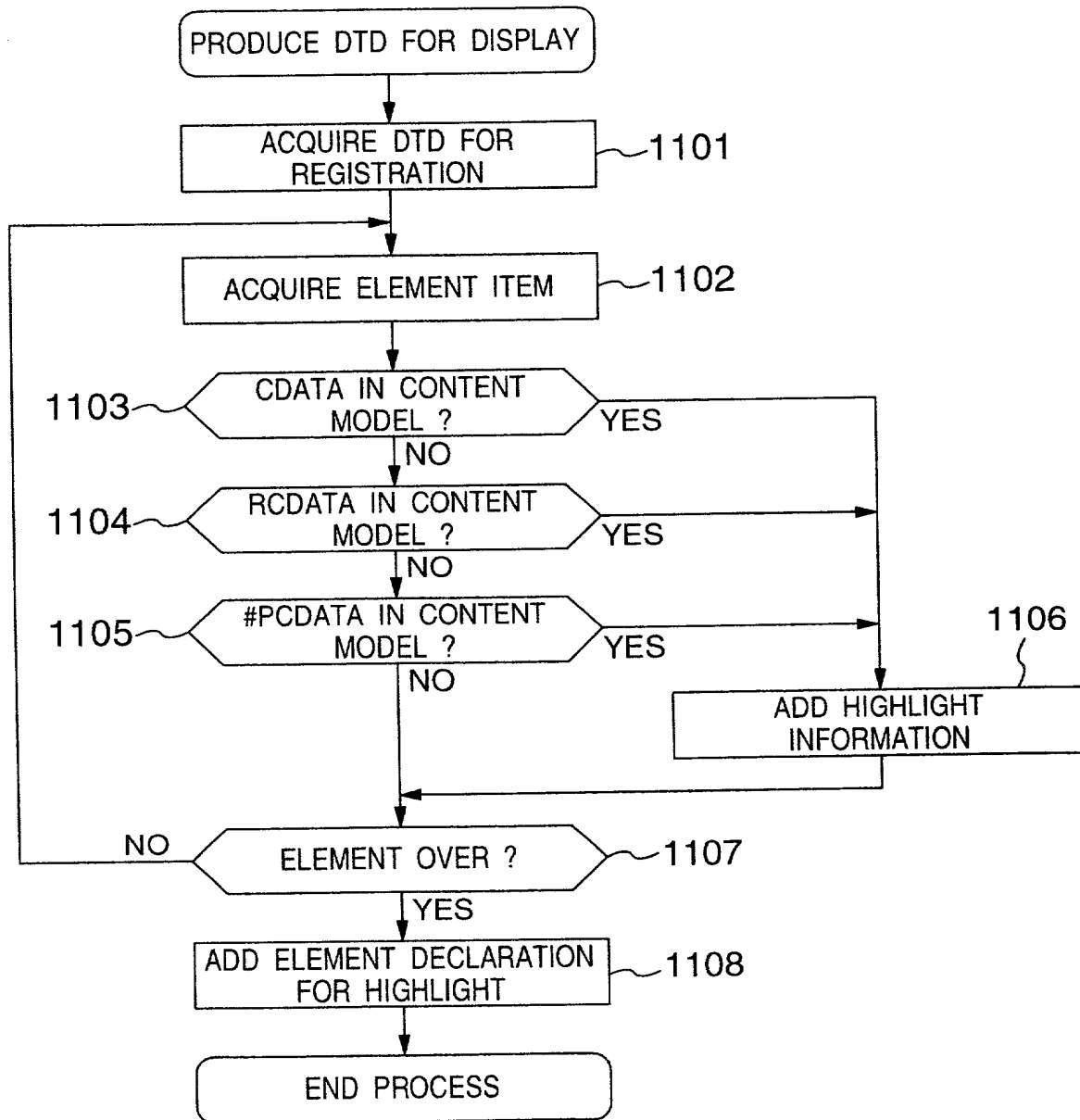
```
<!ELEMENT DOCUMENT... (TITLE, TEXT)>
<!ELEMENT TITLE      ... (#PCDATA | HIGHLIGHT)*>
<!ELEMENT TEXT       ... (#PCDATA | UNDERLINE | HIGHLIGHT)*>
<!ELEMENT UNDERLINE ... (#PCDATA | HIGHLIGHT)*>
<!ELEMENT HIGHLIGHT ... (#PCDATA)>
```

[DOCUMENT INSTANCE]

1004

```
<!DOCTYPE DOCUMENT SYSTEM "DISPLAY. dtd">
<DOCUMENT>
<TITLE> <HIGHLIGHT> STRUCTURED DOCUMENT </HIGHLIGHT> </TITLE>
<TEXT>
<UNDERLINE> <HIGHLIGHT> STRUCTURED </HIGHLIGHT> </UNDERLINE>
<HIGHLIGHT> DOCUMENT </HIGHLIGHT> IS A TEXT ....
</TEXT>
</DOCUMENT>
```

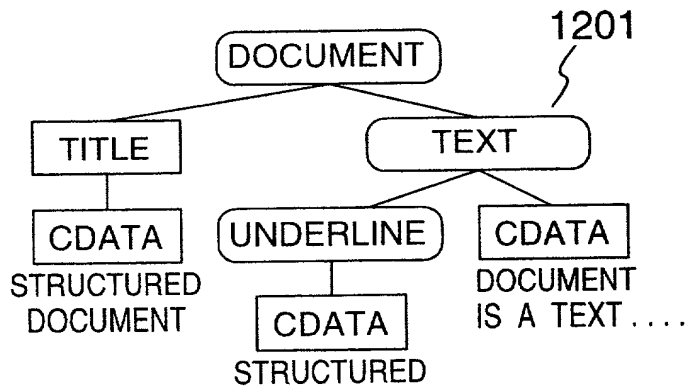
FIG. 11



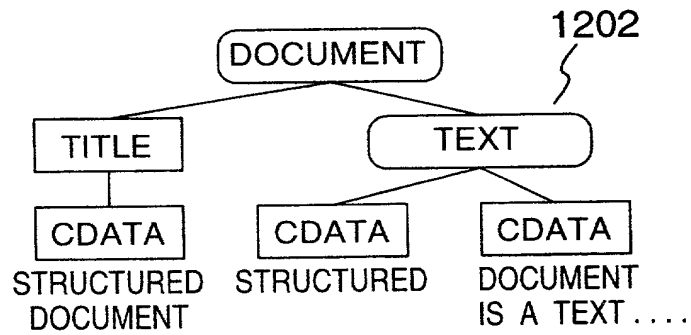
<FLOWCHART FOR PRODUCING DTD FOR DISPLAY>

FIG. 12

<NORMALIZE FOR SEARCH OF STRUCTURED DOCUMENT>



DELETE UNREQUIRED
ELEMENT (UNDERLINED)



COUPLE TEXT

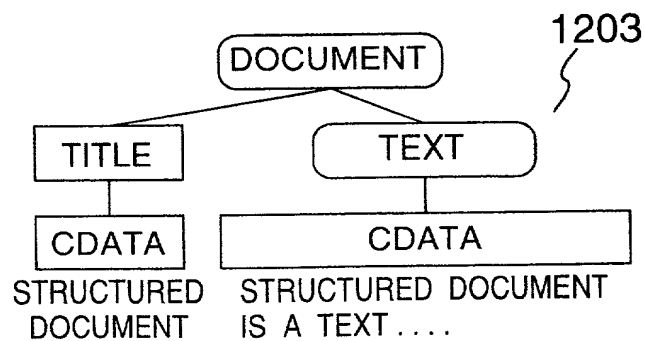
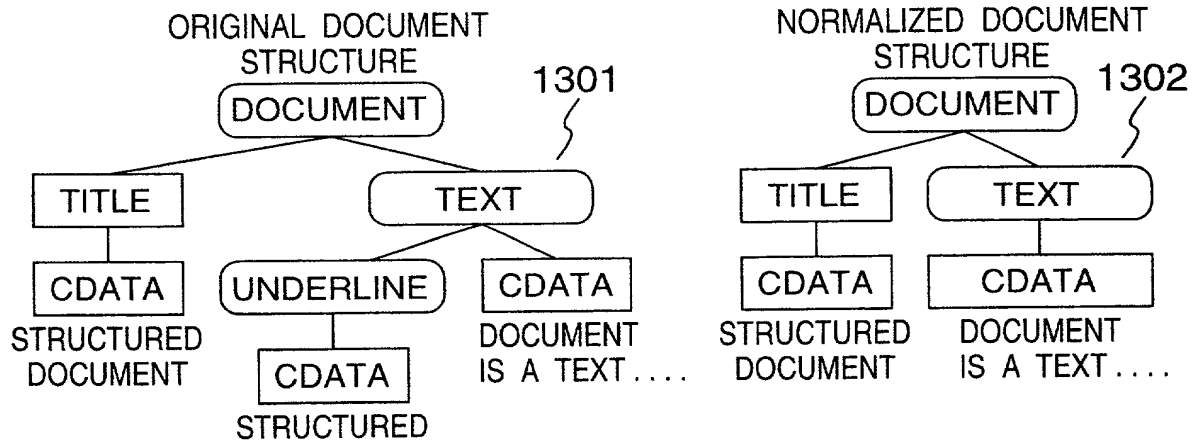


FIG. 13

<CONVERT NORMALIZED DOCUMENT TO TABLE FORMAT DATA>



CONVERT TO TABLE
FORMAT DATA 1303

ELEMENT INFORMATION TABLE

ELEMENT ID	ELEMENT TYPE	TAG	CONTENT
0	DOCUMENT	DOCUMENT	SUBELEMENT: 1, 3
1	ELEMENT	TITLE	SUBELEMENT: 2
2	CDATA	—	CHARACTER STRING: "STRUCTURED DOCUMENT"
3	ELEMENT	TEXT	SUBELEMENT: 4, 6
4	ELEMENT	UNDERLINE	SUBELEMENT: 5
5	CDATA	—	CHARACTER STRING: "STRUCTURED"
6	CDATA	—	CHARACTER STRING: "DOCUMENT IS...."
7	DOCUMENT	DOCUMENT	SUBELEMENT: 1, 8
8	ELEMENT	TEXT	SUBELEMENT: 9
9	CDATA	—	CHARACTER STRING: "STRUCTURED DOCUMENT IS...."

ADD
AFTER
NORMAL-
IZATION

CORRESPONDENCE TABLE FOR NORMALIZATION

NORMAL- IZED ELEMENT ID	ELEMENT TYPE	ORIGINAL ELEMENT ID	CHARACTER STRINGS POSITION	
			AFTER NORMALIZATION	BEFORE NORMALIZATION
7	DOCUMENT	0	—	
8	ELEMENT	3	—	
9	CDATA	5	0-5	0-5

FIG. 14

<MATCHING STRINGS POSITION INFORMATION>

1401

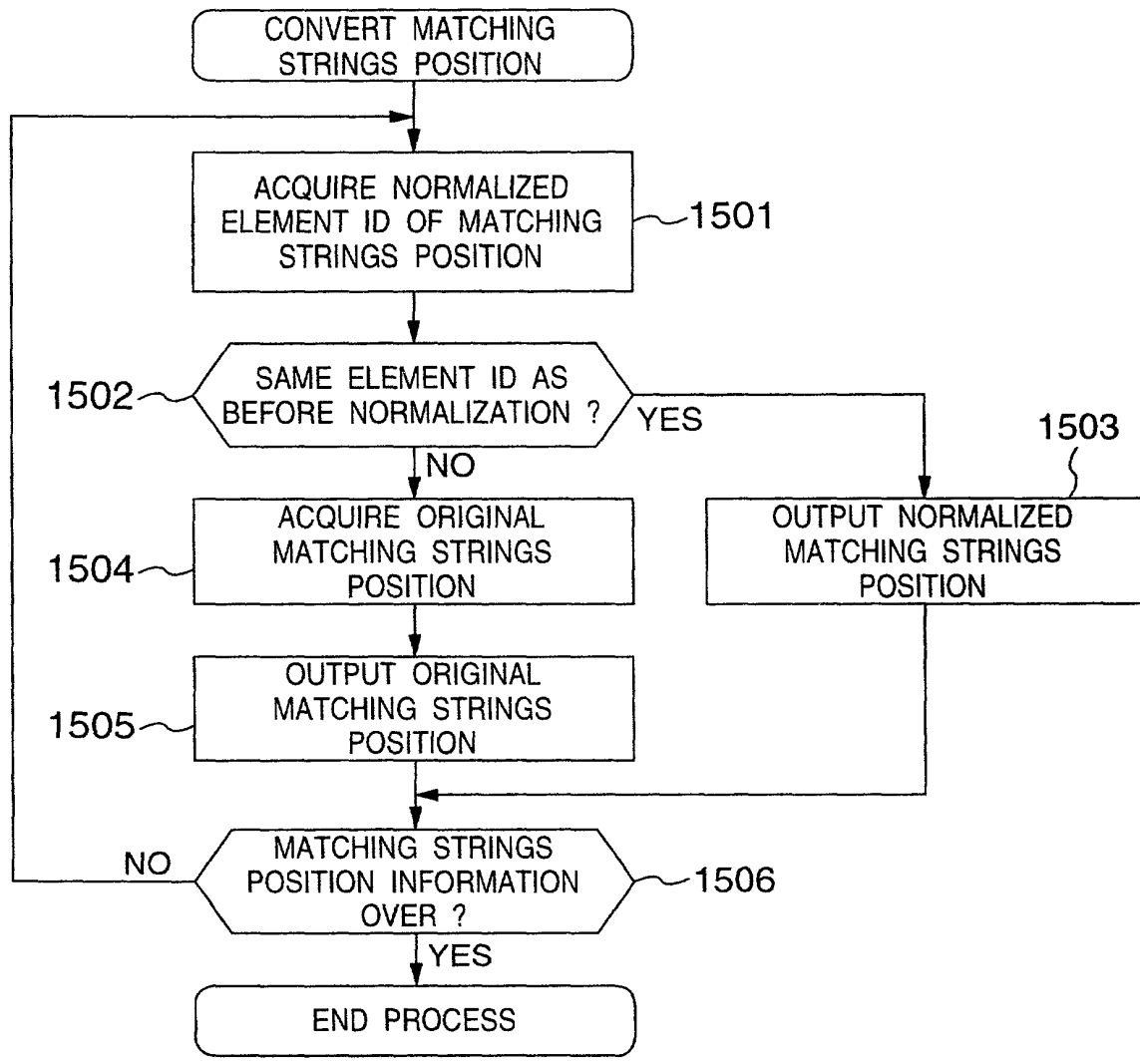
NORMALIZED ELEMENT ID	MATCHING STRINGS POSITION	
	START POSITION	LENGTH
2	0	10
9	0	10

↓
 CONVERT TO
 ORIGINAL POSITION

1402

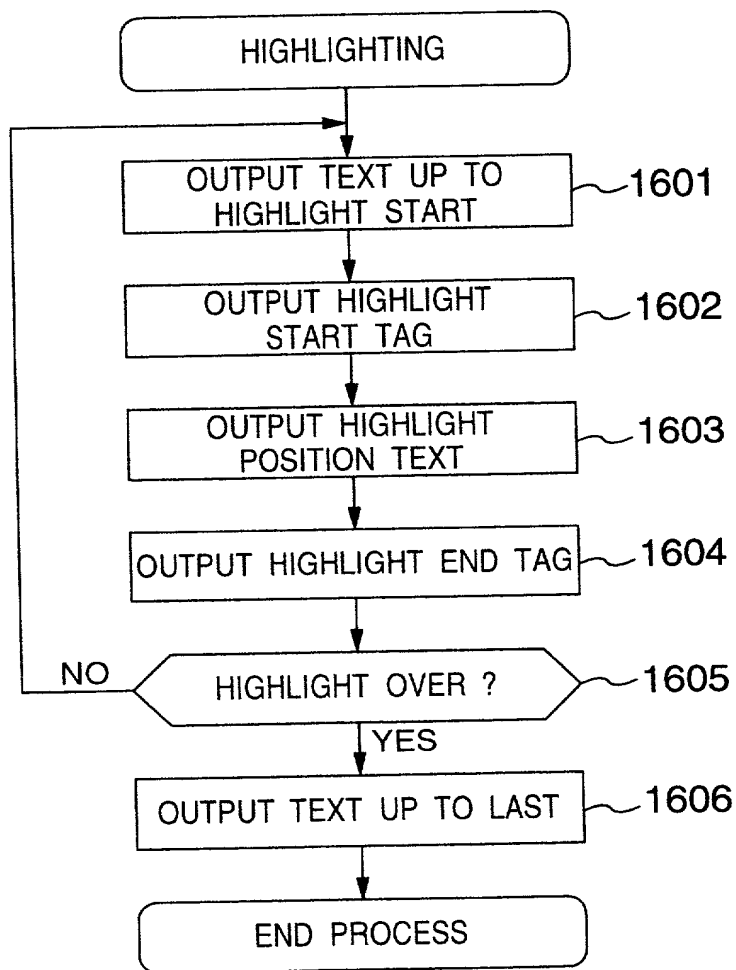
ORIGINAL ELEMENT ID	MATCHING STRINGS POSITION	
	START POSITION	LENGTH
2	0	10
5	0	6

FIG. 15



<FLOWCHART FOR MATCHING STRINGS POSITION ACQUISITION>

FIG. 16



<FLOWCHART FOR HIGHLIGHTING>

FIG. 17

<MATCHING STRINGS POSITION INFORMATION>

ELEMENT ID	MATCHING CONDITION	MATCHING STRINGS POSITION	
		START POSITION	LENGTH
2	TERM	0	10
9	FREQUENCY	0	10
9	ELEMENT	0	50
9	TERM	30	4
9	TERM	36	4
9	PROXIMITY	30	10

FIG. 18

<HIGHLIGHTING METHOD DEFINITION>

MATCHING CONDITION	HIGHLIGHTING METHOD	HIERARCHY INFORMATION
TERM	RED	1
FREQUENCY	FONT LARGE	1
PROXIMITY	UNDERLINE	2
ELEMENT	ITALIC	3

FIG. 19

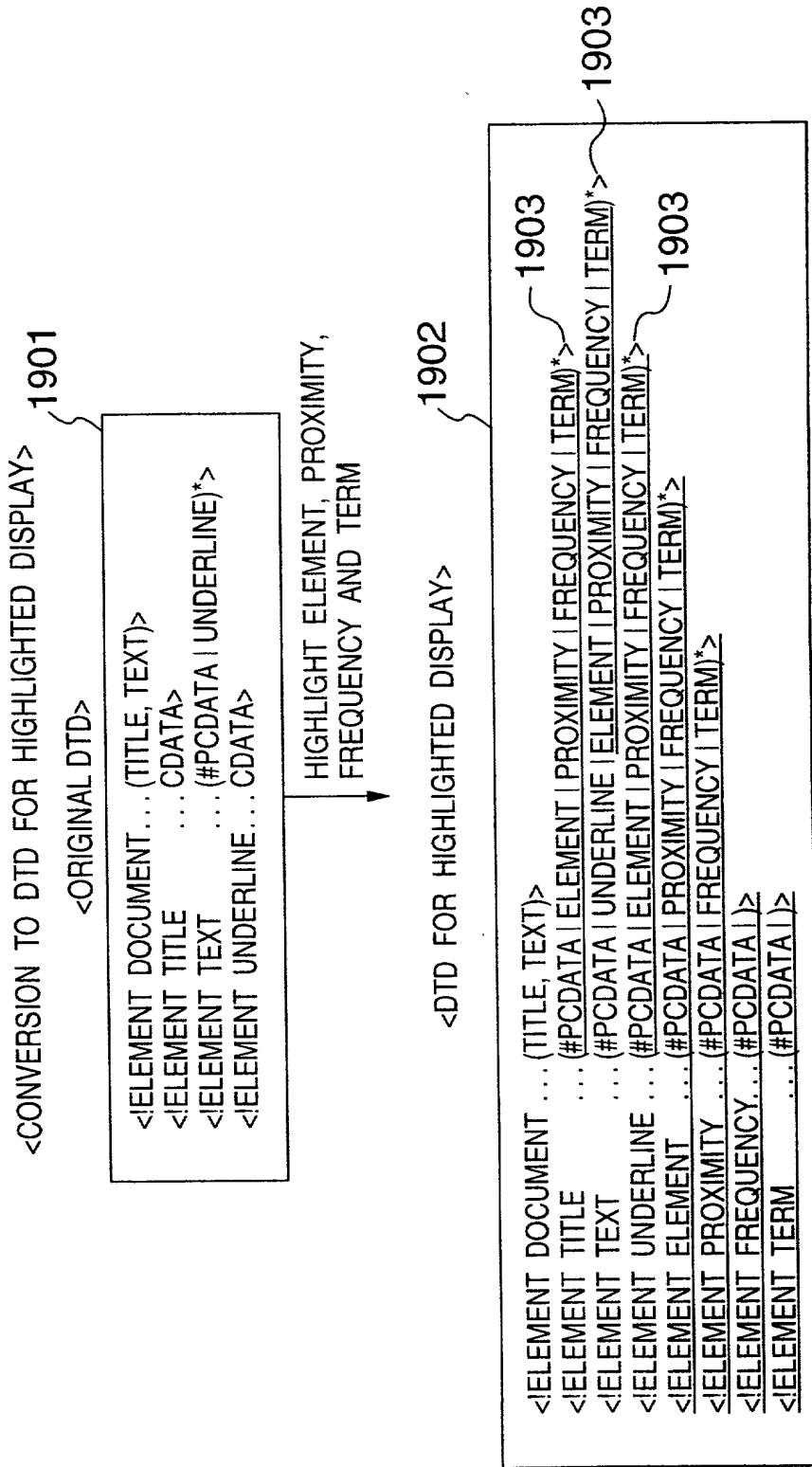
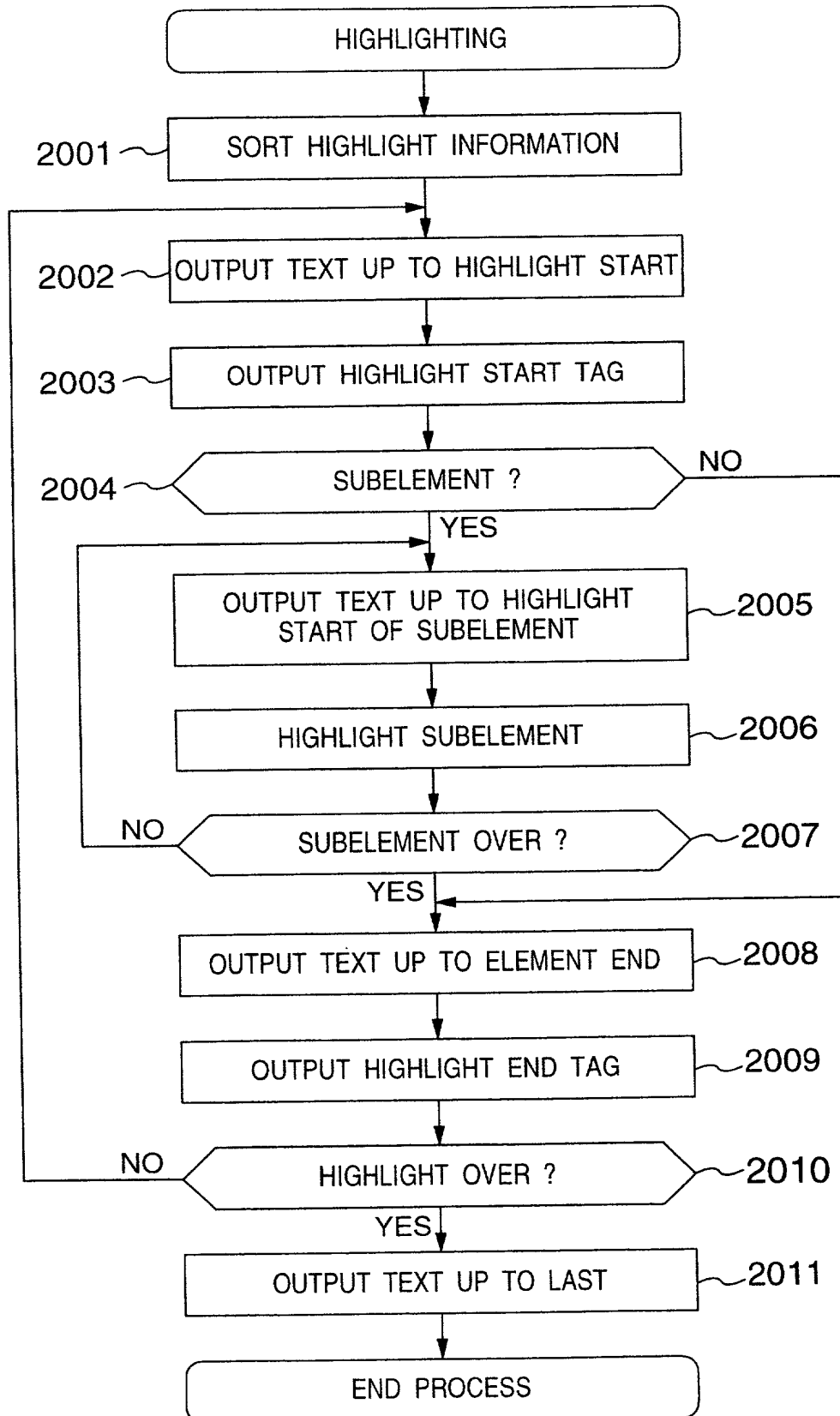


FIG. 20



<FLOWCHART FOR MATCHING STRINGS POSITION ACQUISITION>

FIG. 21

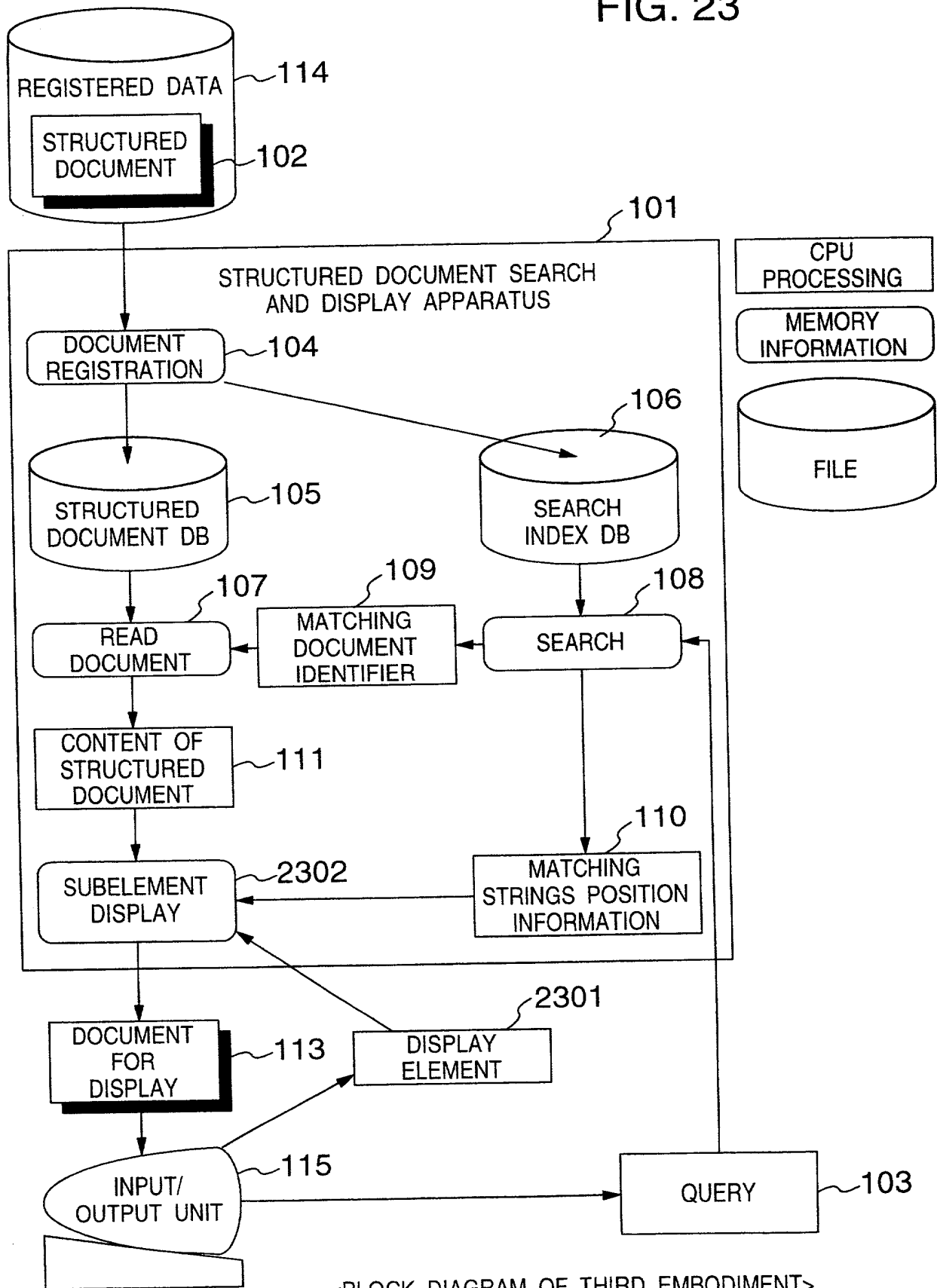
```
<DOCUMENT>
<TITLE><TERM>STRUCTURED DOCUMENT</TERM></TITLE>
<TEXT>
<UNDERLINE><ELEMENT><FREQUENCY>STRUCTURED</FREQUENCY>
</ELEMENT></UNDERLINE><ELEMENT><FREQUENCY>DOCUMENT
</FREQUENCY>IS A DOCUMENT WITH <PROXIMITY>
<TERM>TAG</TERM>INSERTED</TERM></PROXIMITY> IN TEXT ...
</ELEMENT>
</TEXT>
</DOCUMENT>
```

FIG. 22

<EXAMPLE OF HIGHLIGHTED DISPLAY>

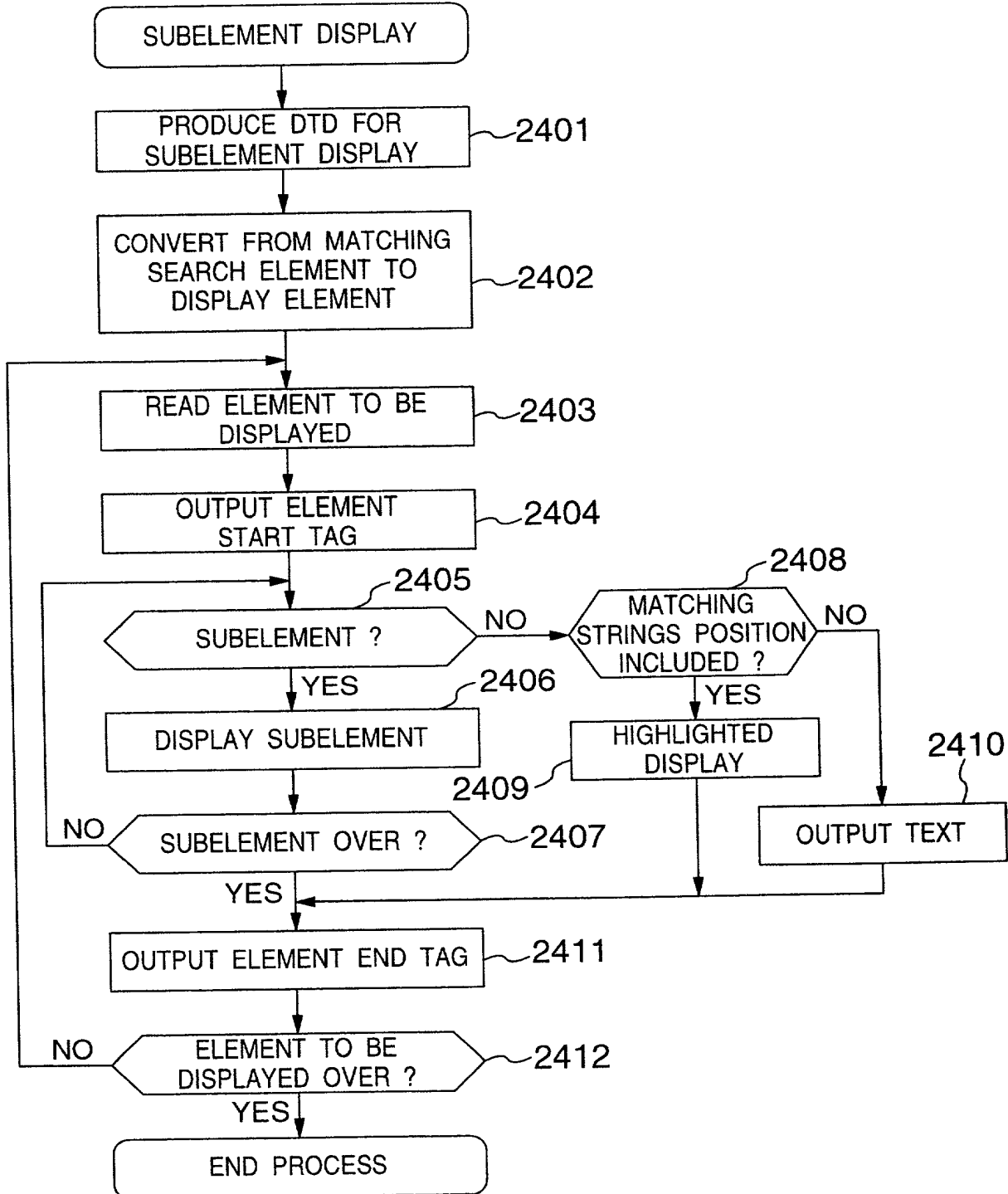
STRUCTURED DOCUMENT IS A DOCUMENT WITH TAG INSERTED IN TEXT ...

FIG. 23



<BLOCK DIAGRAM OF THIRD EMBODIMENT>

FIG. 24



<FLOWCHART FOR DISPLAY OF STRUCTURED DOCUMENT>

FIG. 25

<CONVERSION TO DTD FOR SUBELEMENT DISPLAY>

<ORIGINAL DTD>

2501

```
<!ELEMENT DOCUMENT... (TITLE, TEXT)>
<!ELEMENT TITLE      ... CDATA>
<!ELEMENT TEXT       ... (#PCDATA | UNDERLINE)*>
<!ELEMENT UNDERLINE... CDATA>
```

MAKE POSSIBLE
SUBELEMENT
EXTRACTION

ADD HIGHLIGHT

<DTD FOR SUBELEMENT DISPLAY>

2502

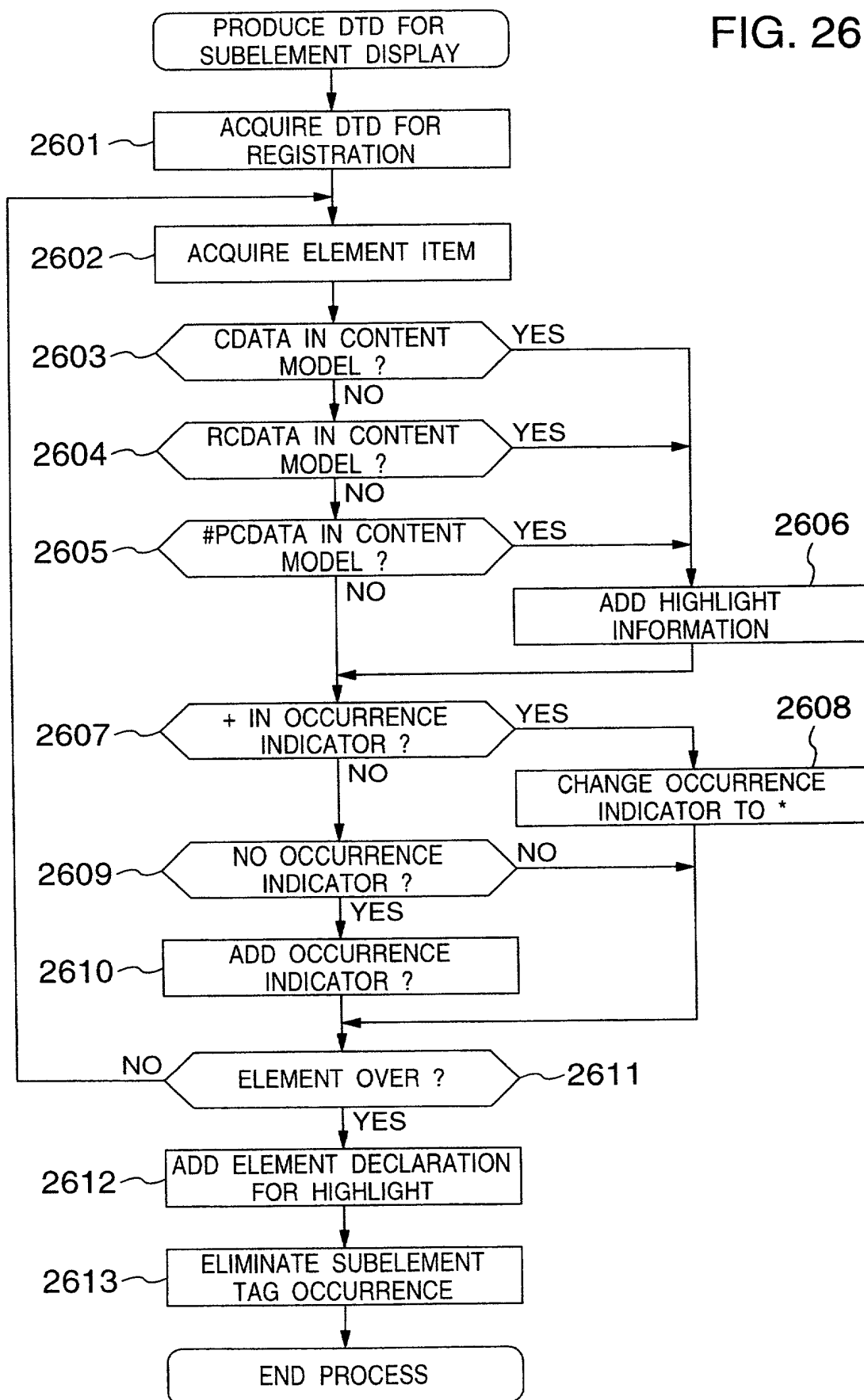
```
<!ELEMENT DOCUMENT 00 (TITLE ?, TEXT ?)>
<!ELEMENT TITLE     ... (#PCDATA | HIGHLIGHT)*>
<!ELEMENT TEXT      00 (#PCDATA | UNDERLINE | HIGHLIGHT)*>
<!ELEMENT UNDERLINE ... (#PCDATA | HIGHLIGHT)*>
<!ELEMENT HIGHLIGHT ... (#PCDATA)>
```

<EXAMPLE OF SGML WITH SUBELEMENT EXTRACTED>

2503

```
<TITLE>
<HIGHLIGHT> STRUCTURED DOCUMENT </HIGHLIGHT>
</TITLE>
```

FIG. 26



<FLOWCHART FOR PRODUCING DTD FOR SUBELEMENT DISPLAY>

FIG. 27

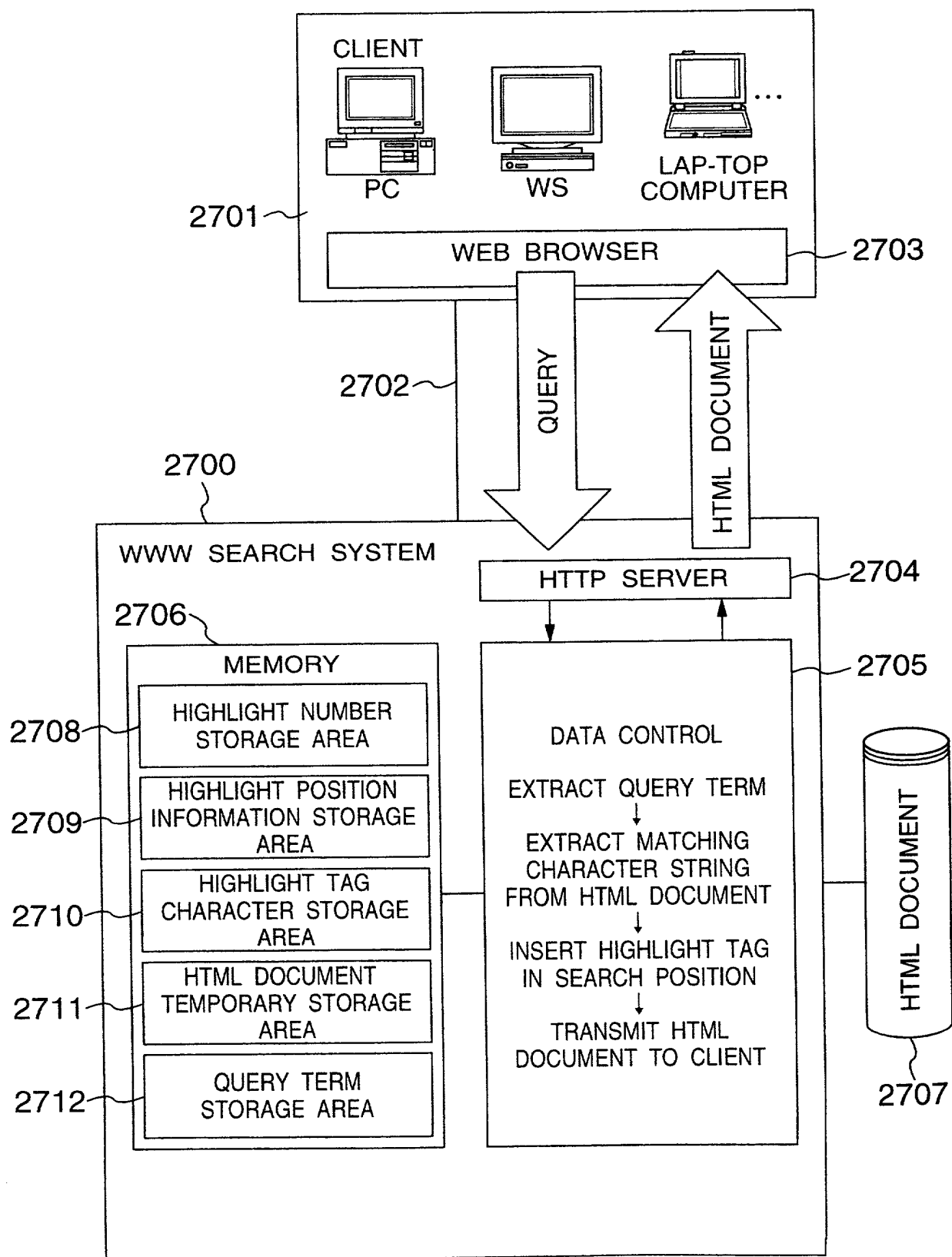


FIG. 28

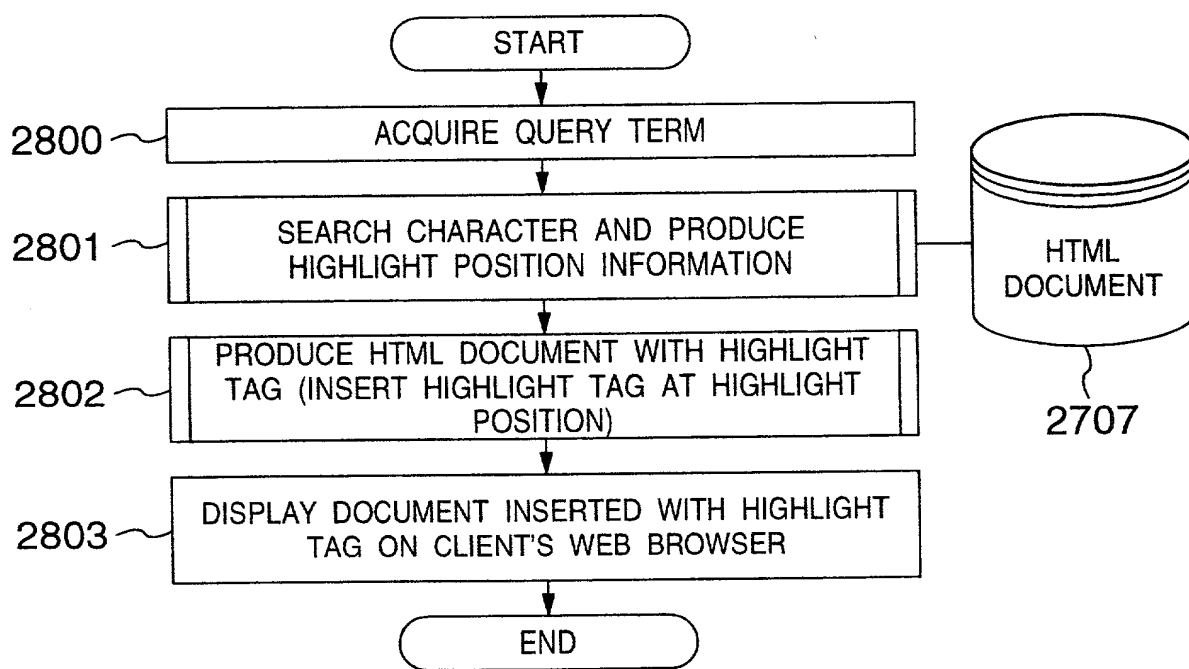


FIG. 29

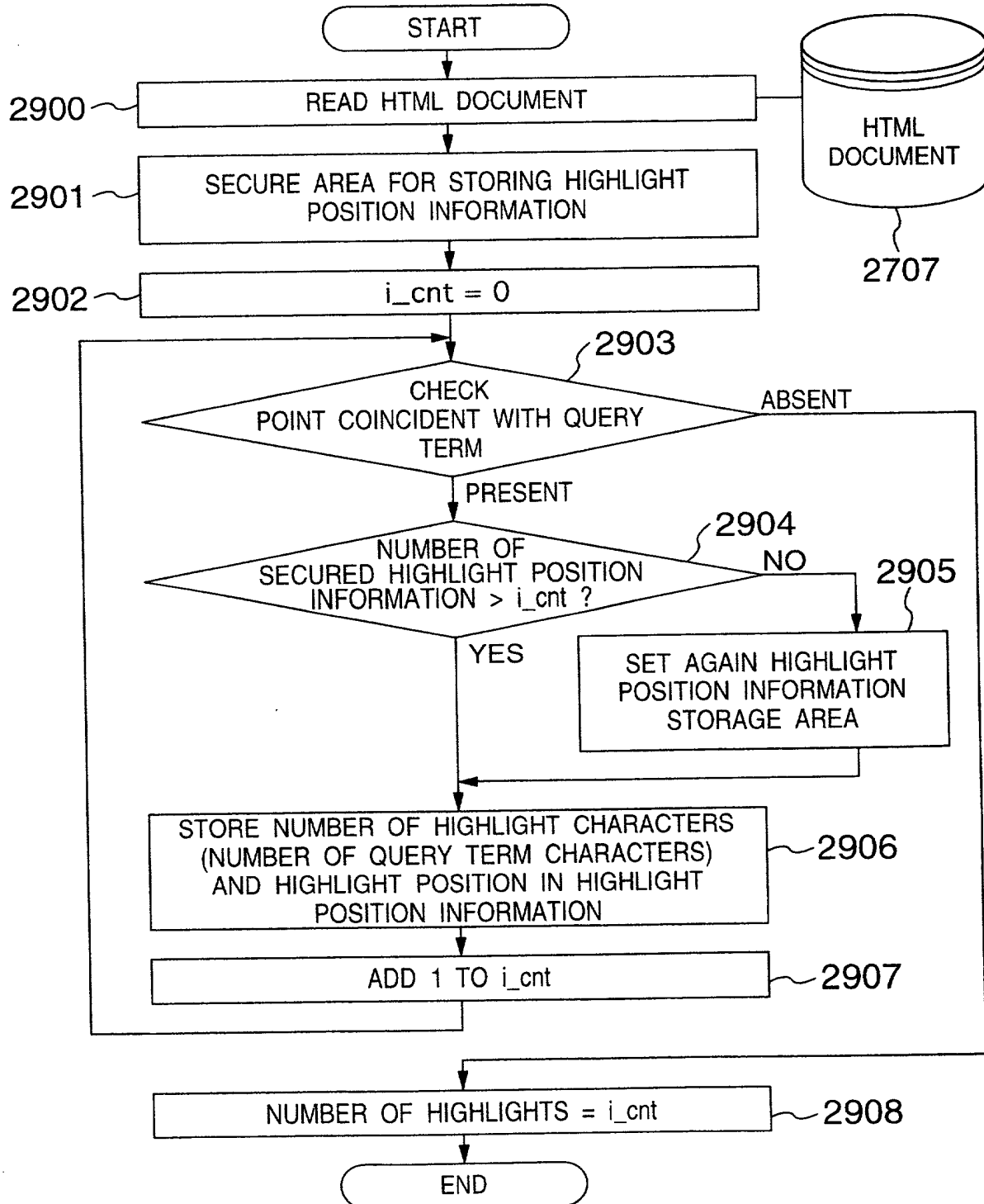


FIG. 30

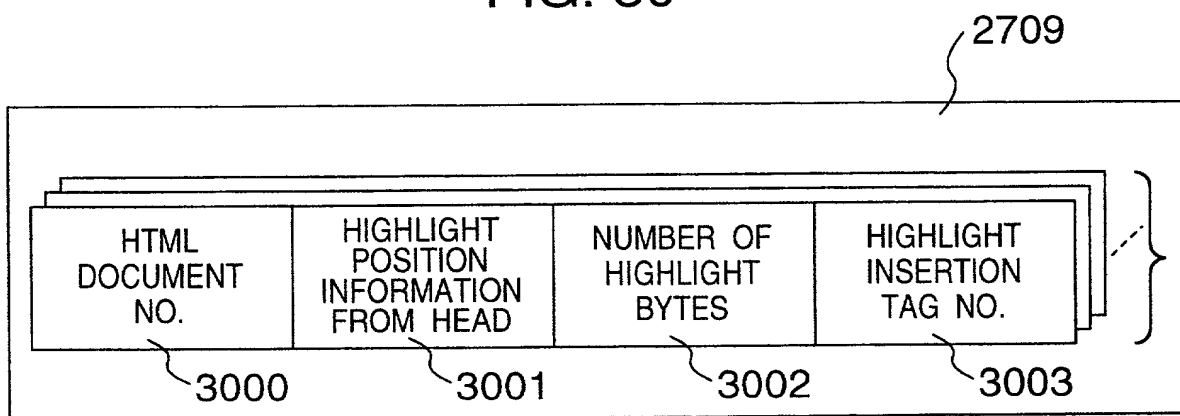


FIG. 31

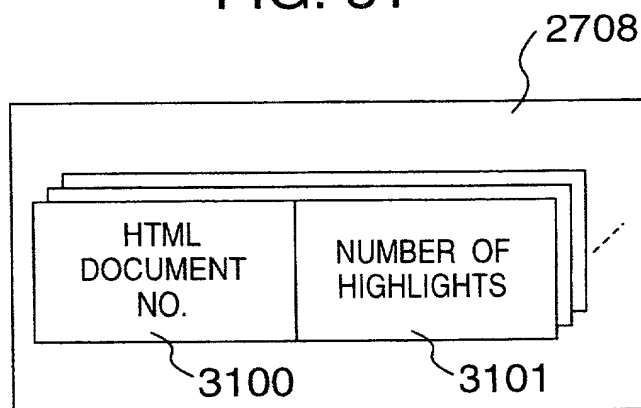
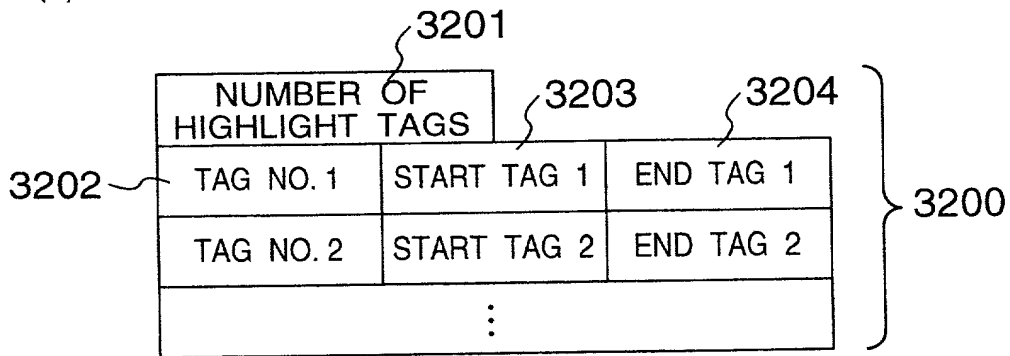


FIG. 32

(1) STRUCTURE



(2) APPLICATION

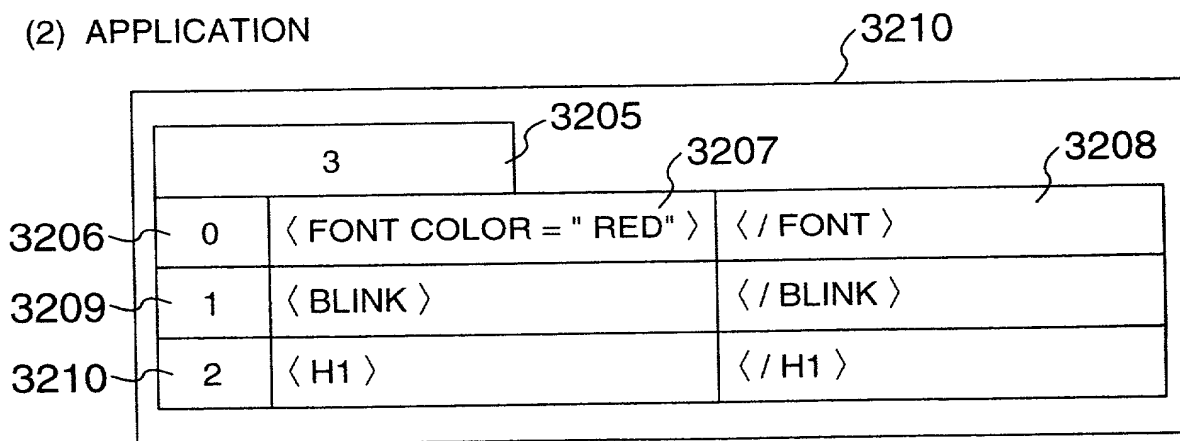


FIG. 33

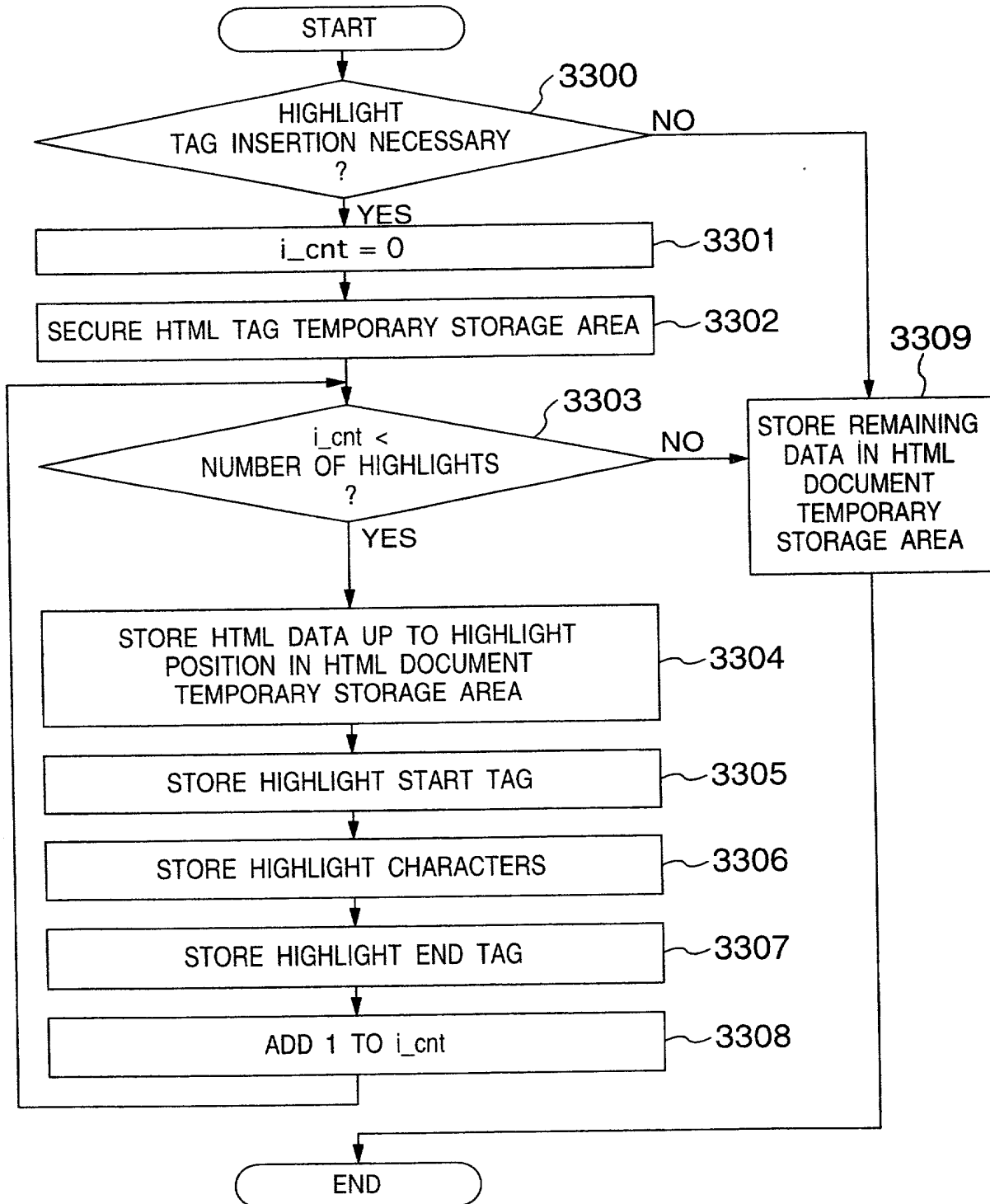
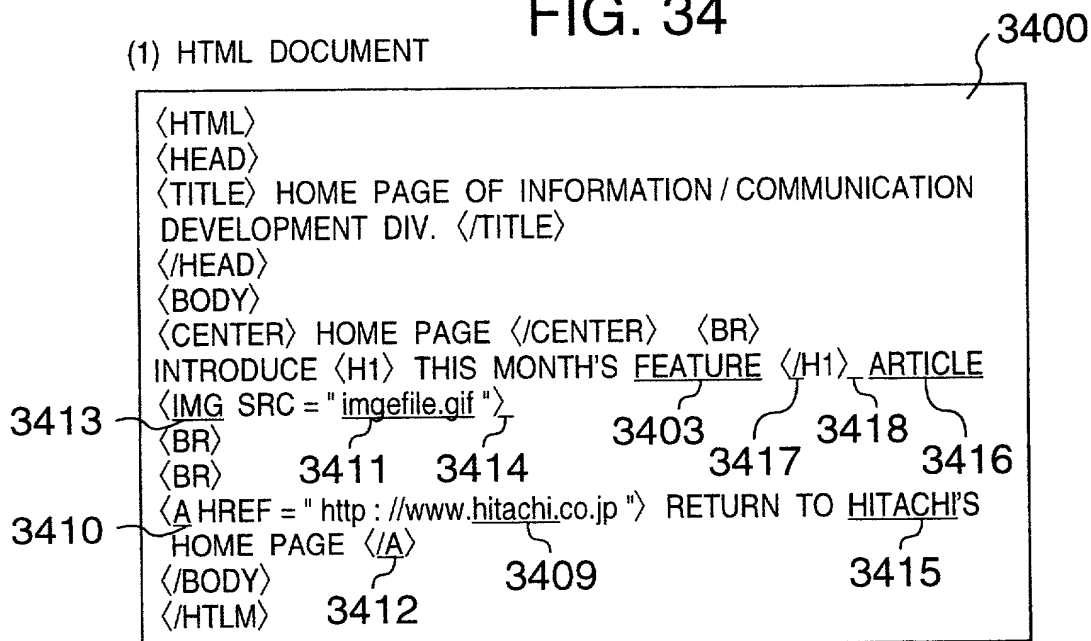
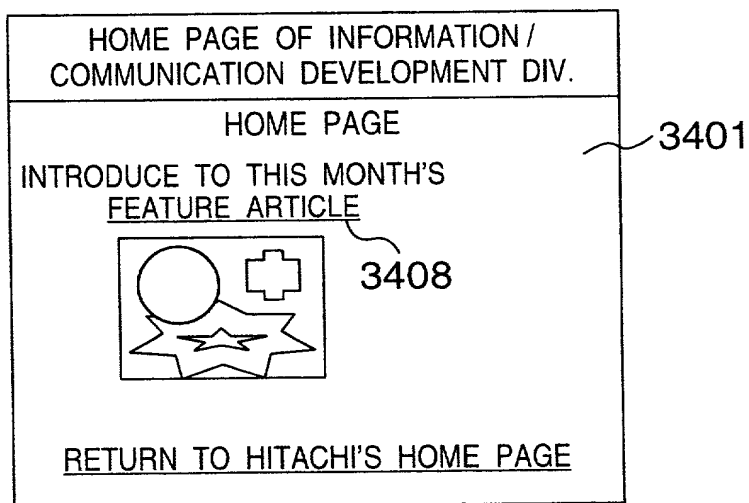


FIG. 34

(1) HTML DOCUMENT



(2) DISPLAY SCREEN



(3) HIGHLIGHT POSITION INFORMATION STORAGE AREA

HTML DOCUMENT NO.	HIGHLIGHT POSITION INFORMATION FROM HEAD	NUMBER OF HIGHLIGHTS	HIGHLIGHT INSERTION TAG NO.
001	122	4	1

3402 is a bracket indicating the entire table.

3404 points to the HTML DOCUMENT NO. cell.

3405 points to the HIGHLIGHT POSITION INFORMATION FROM HEAD cell.

3406 points to the NUMBER OF HIGHLIGHTS cell.

3407 points to the HIGHLIGHT INSERTION TAG NO. cell.

FIG. 35

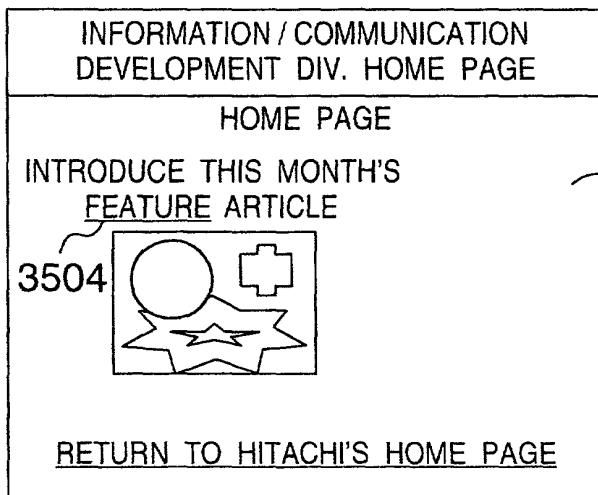
(1) HTML DOCUMENT AFTER HIGHLIGHT TAG INSERTION

3500

```

<HTML>
<HEAD>
<TITLE> INFORMATION / COMMUNICATION DEVELOPMENT DIV.
HOME PAGE </TITLE>
</HEAD>
<BODY>
<CENTER> HOME PAGE </CENTER>  <BR>
INTRODUCE <H1> THIS MONTH'S <BLINK> FEATURE </BLINK>
</H1> ARTICLE
<IMG SRC = " imgefile.gif ">      3501      3502
<BR>
<BR>
<A HREF = " http : //www.hitachi.co.jp "> RETURN TO HITACHI'S HOME PAGE
</A>
</BODY>
</HTLM>
    
```

(2) DISPLAY SCREEN AFTER HIGHLIGHT TAG INSERTION



3503

3504

FIG. 36

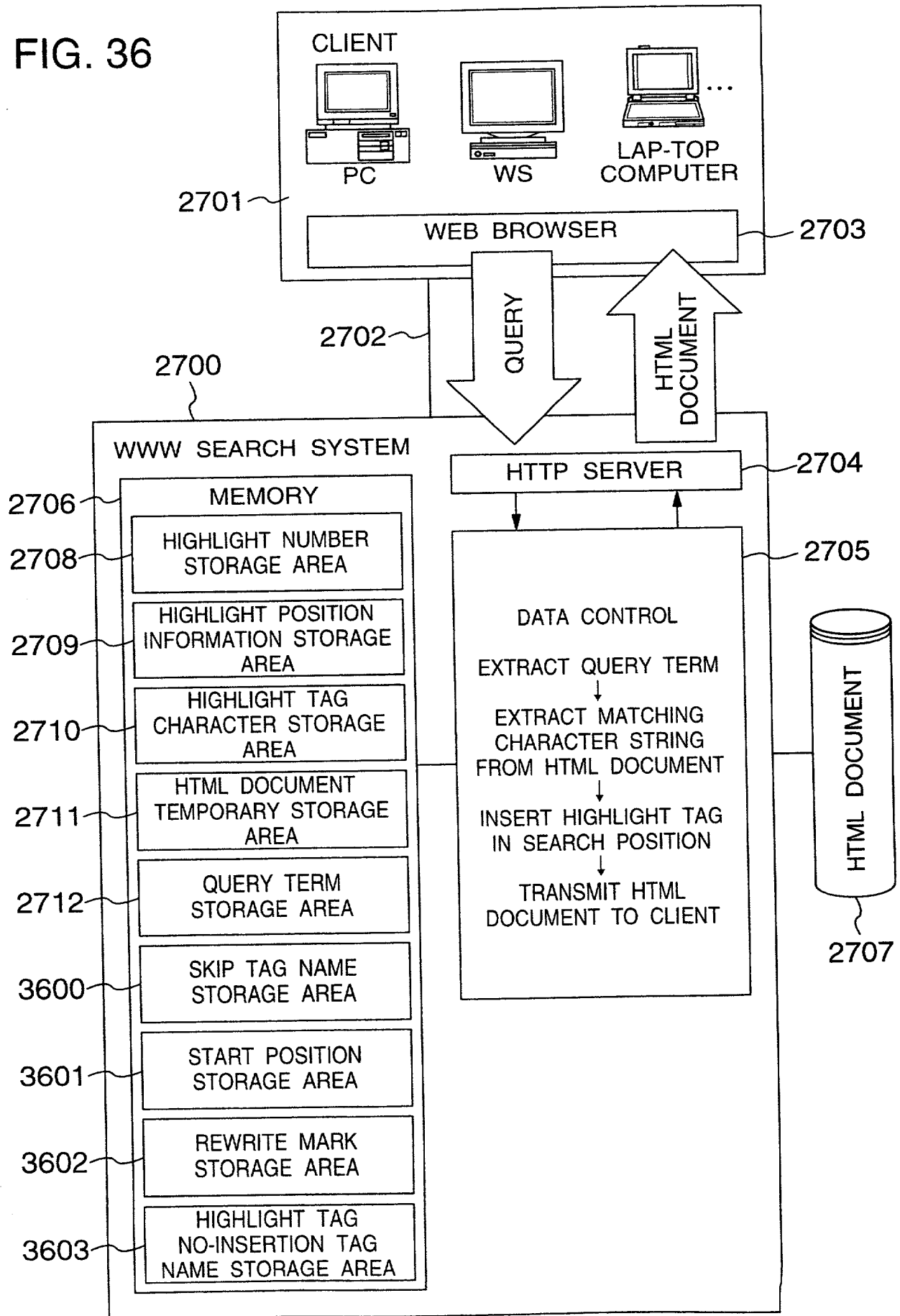


FIG. 37

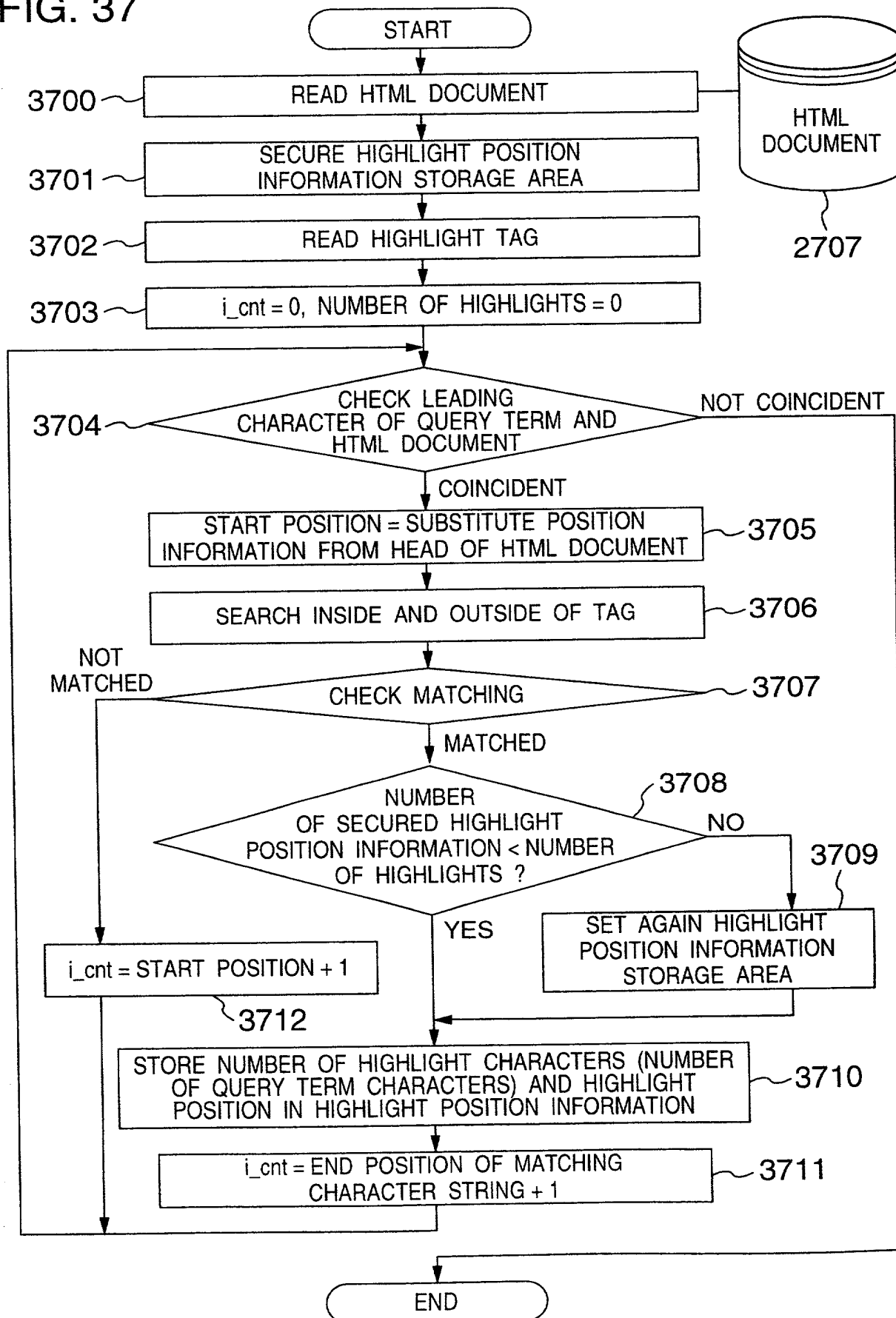


FIG. 38

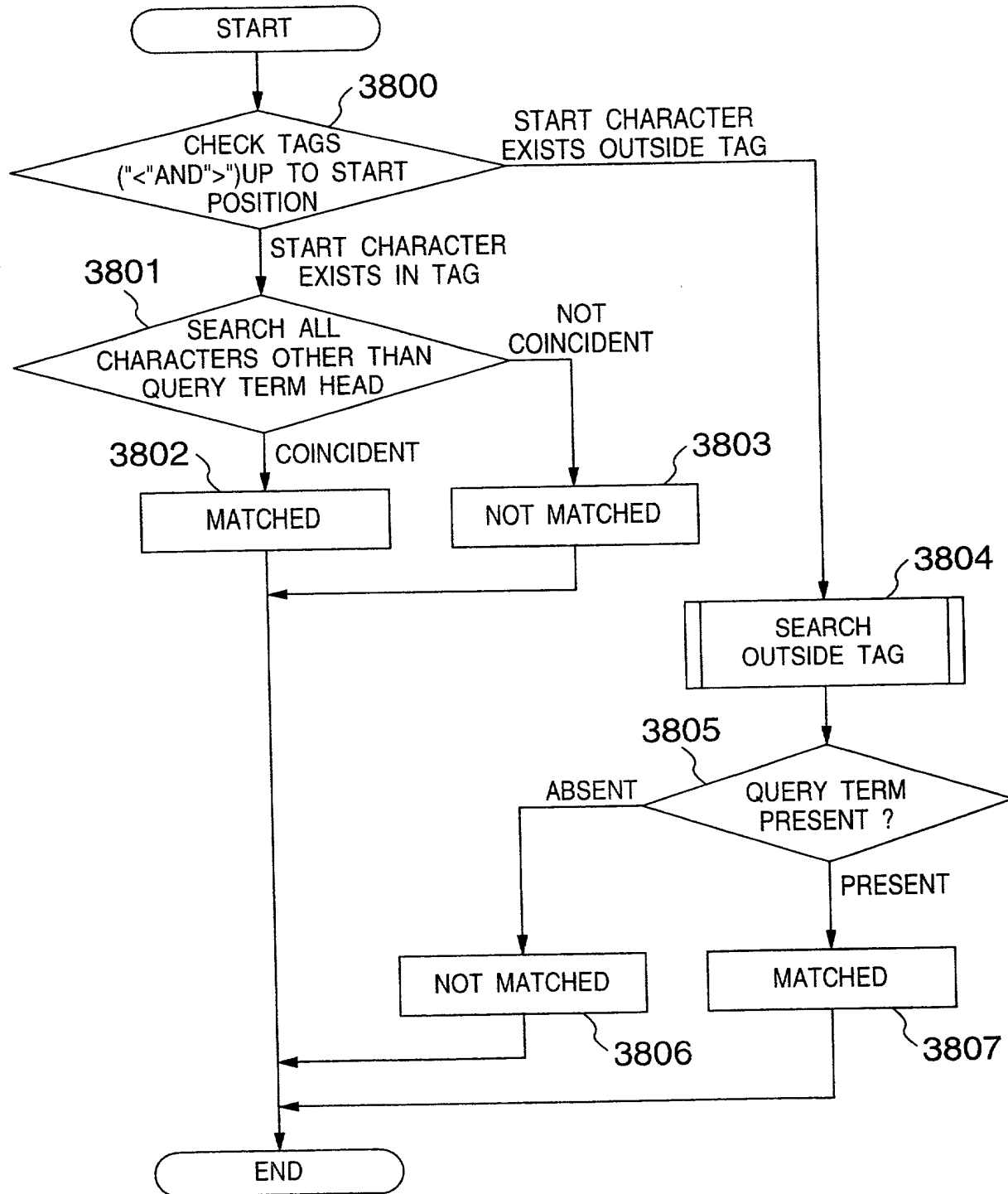


FIG. 39

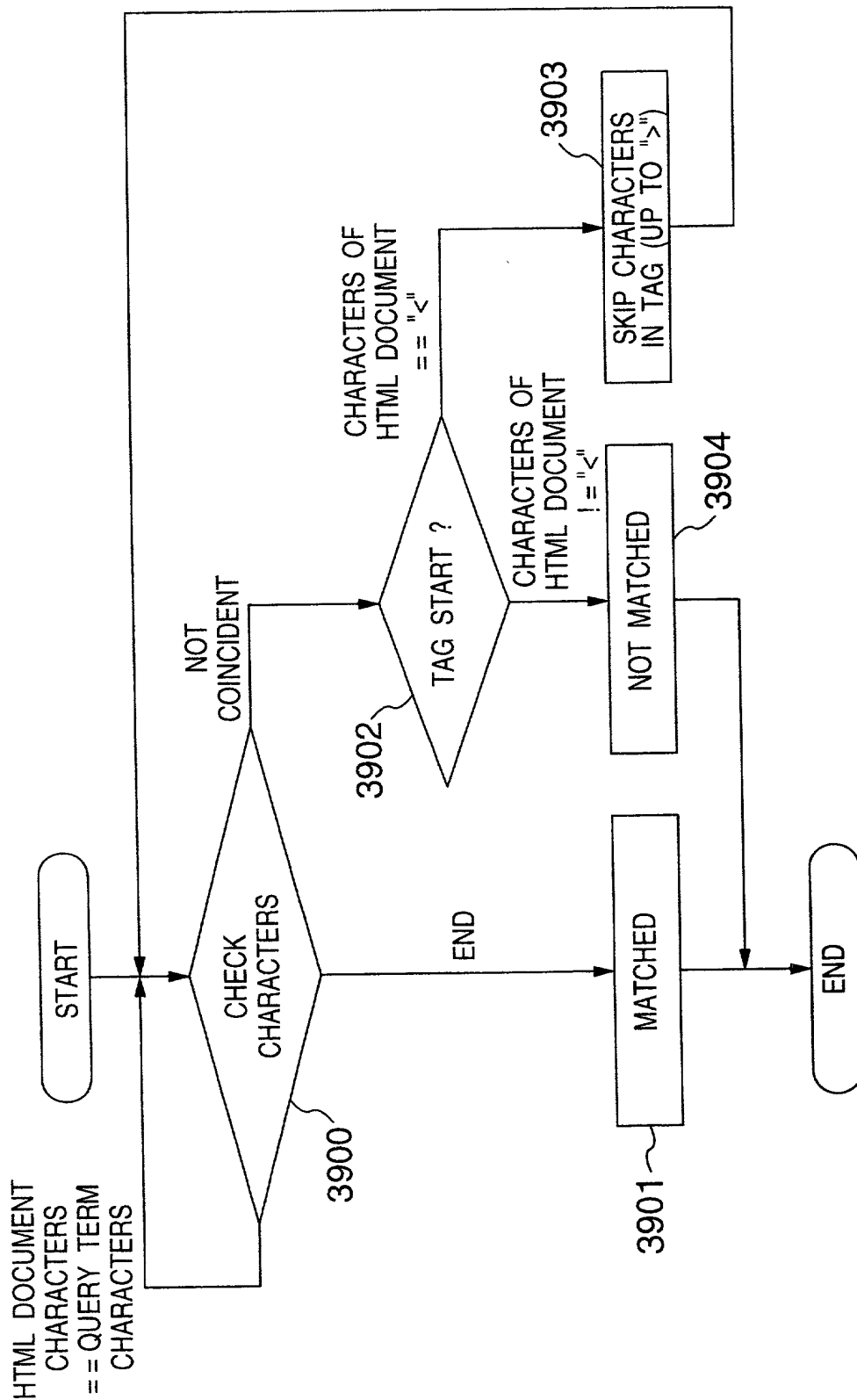


FIG. 40

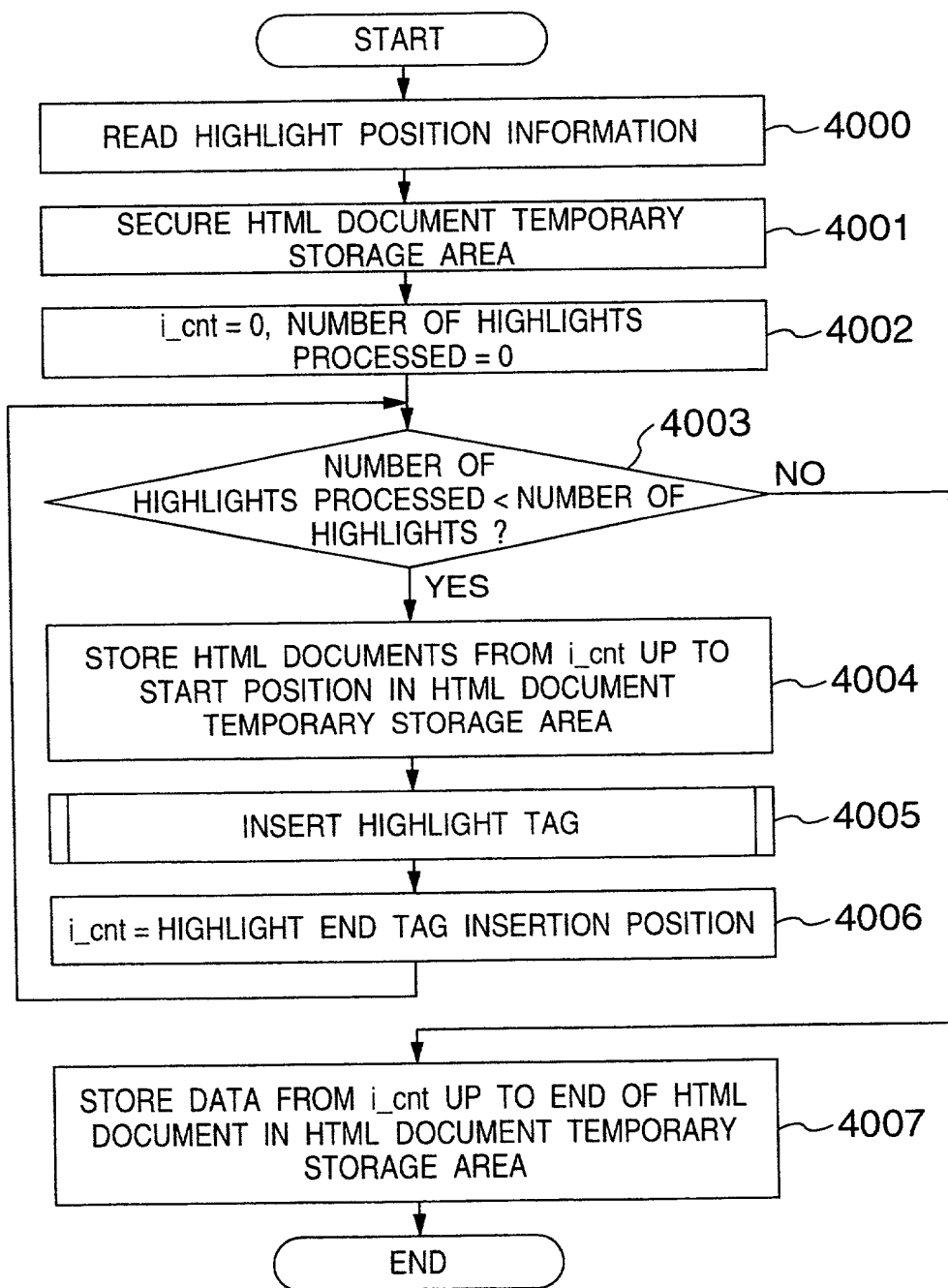


FIG. 41

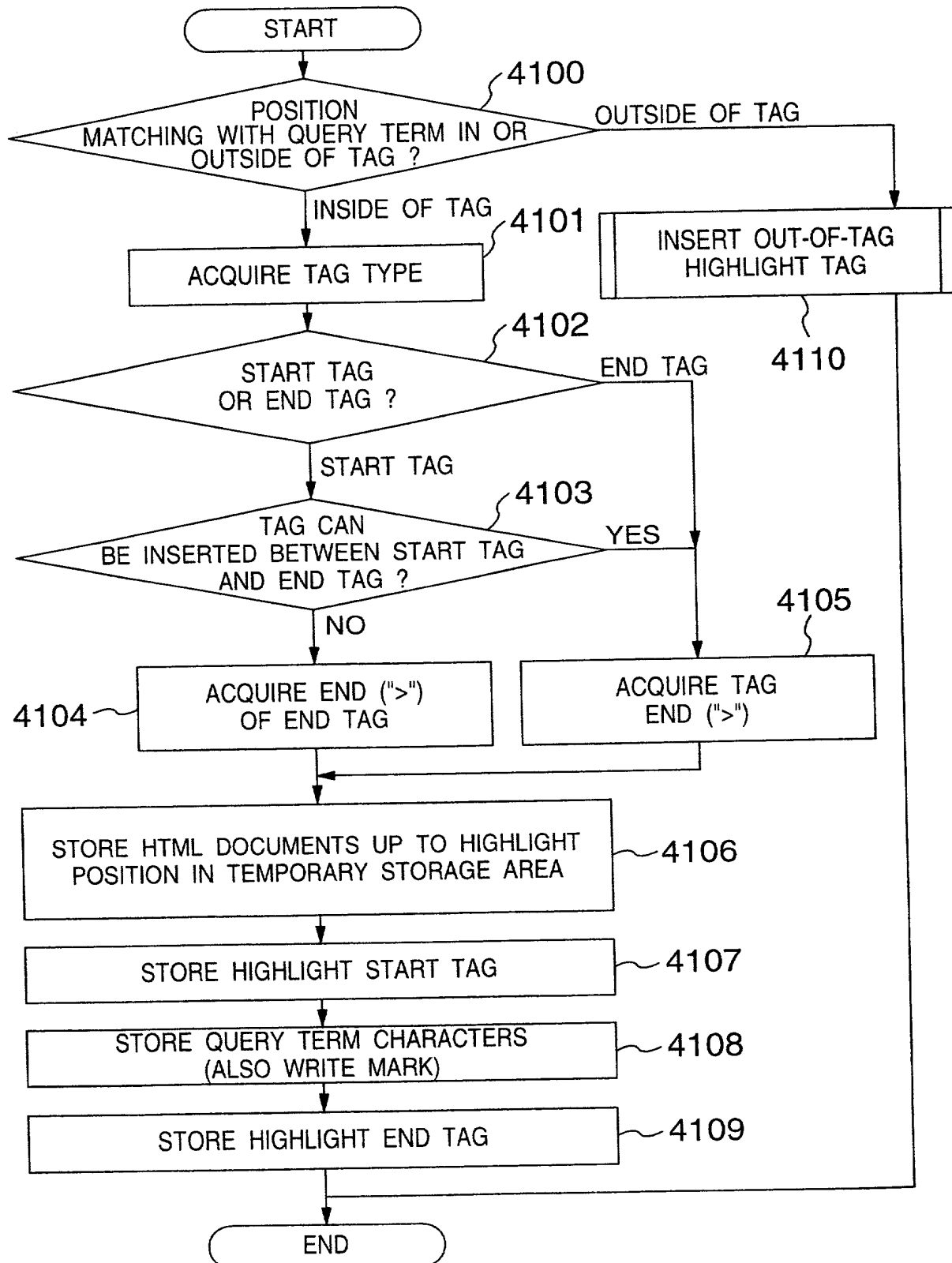


FIG. 42

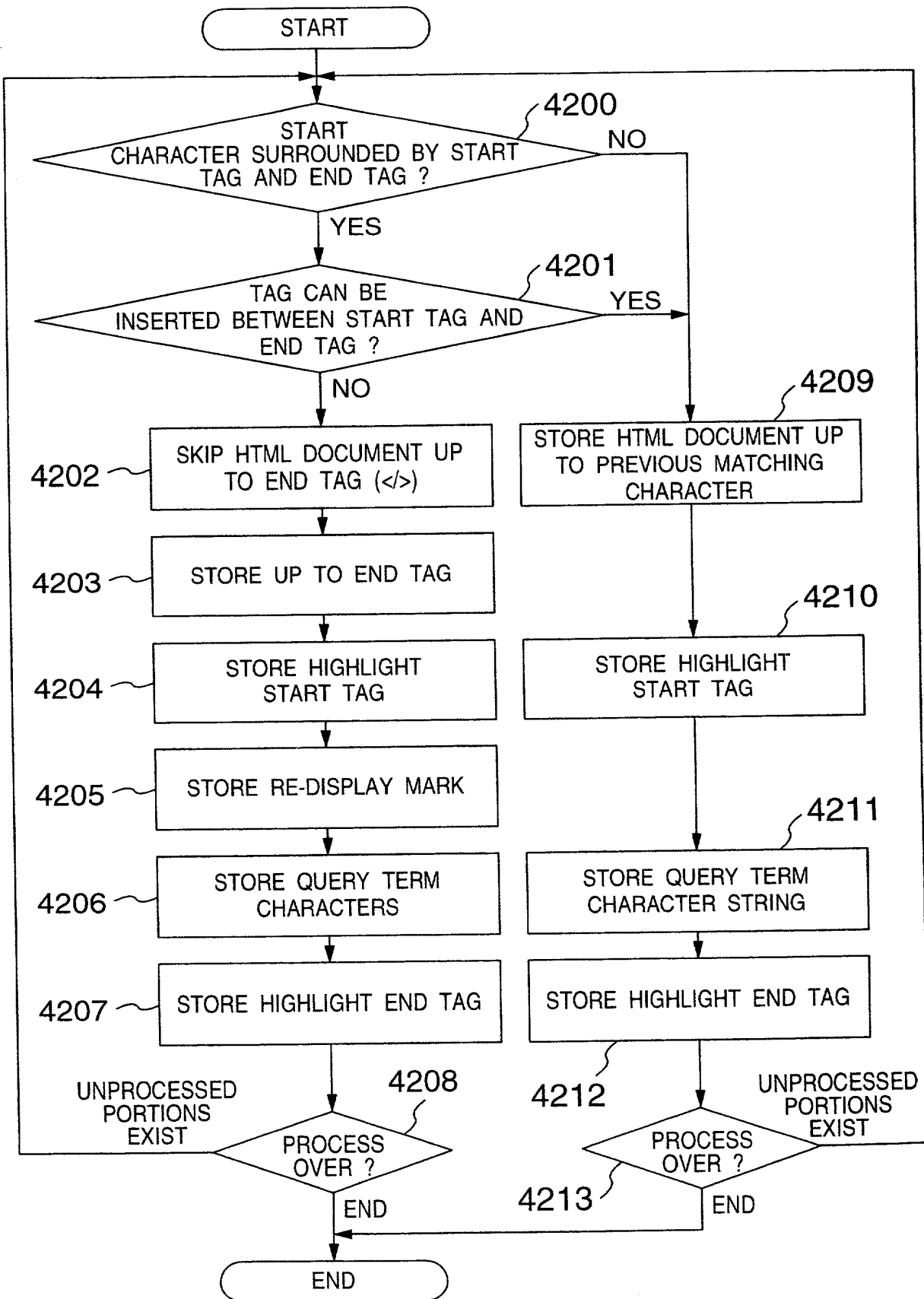


FIG. 43

<DOCUMENT.TITLE> : "STRUCTURED DOCUMENT" {BLUE} AND
<DOCUMENT.TEXT> {CORRUGATED UNDERLINE} : ("STRUCTURED DOCUMENT")
OR C<10 {REVERSE} ("TAG", "INSERT")

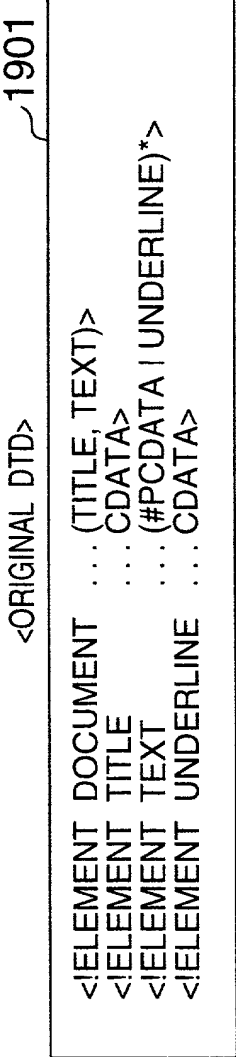
FIG. 44

<MATCHING STRINGS POSITION INFORMATION>

ELEMENT ID	HIGHLIGHTING METHOD	MATCHING CONDITION	MATCHING STRINGS POSITION	
			START POSITION	LENGTH
2	BLUE	TERM	0	10
9	—	FREQUENCY	0	10
9	CORRUGATED UNDERLINE	ELEMENT	0	50
9	—	TERM	30	4
9	—	TERM	36	4
9	REVERSE	PROXIMITY	30	10

FIG. 45

<CONVERSION TO DTD FOR HIGHLIGHTED DISPLAY IN SIXTH EMBODIMENT>



ADD HIGHLIGHT INFORMATION
FOR DISPLAY DOCUMENT

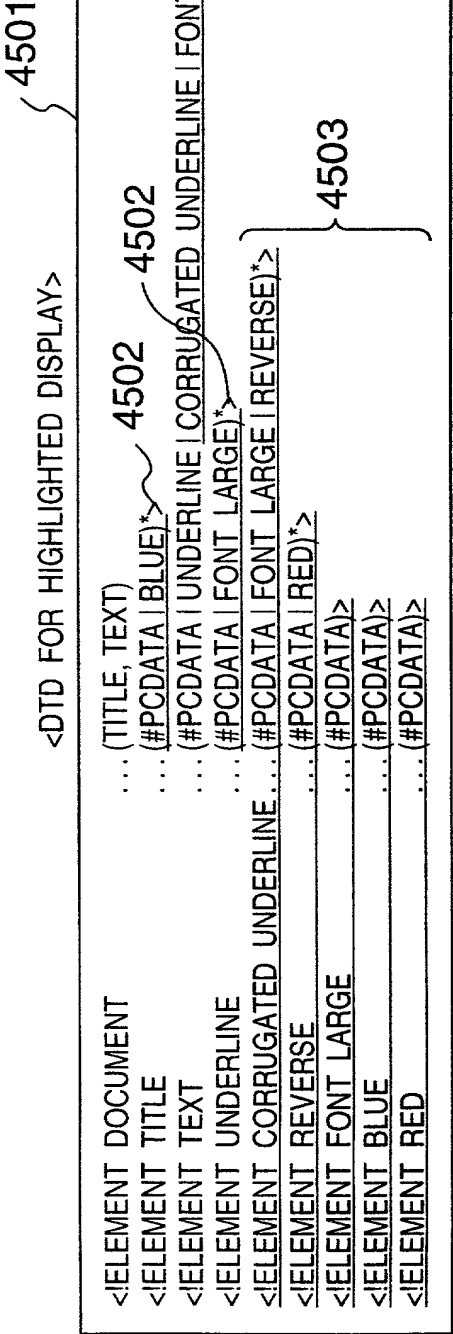


FIG. 46

```
<DOCUMENT>
<TITLE> <BLUE>STRUCTURED DOCUMENT </BLUE> </TITLE>
<TEXT>
<UNDERLINE> <CORRUGATED UNDERLINE> <FONT LARGE>STRUCTURED </FONT LARGE>
</CORRUGATED UNDERLINE> </UNDERLINE> <CORRUGATED UNDERLINE> <FONT LARGE>
DOCUMENT </FONT LARGE> IS A DOCUMENT ... </CORRUGATED UNDERLINE> IN WHICH
<REVERSE> <RED> TAG </RED> IS <RED> INSERTED </RED> </REVERSE> IN TEXT
</TEXT>
</DOCUMENT>
```

FIG. 47

<EXAMPLE OF HIGHLIGHTED DISPLAY>

STRUCTURED DOCUMENT IS A DOCUMENT WITH **TAG INSERTED** IN TEXT